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INCREASING COOPERATIVE SOCIAL INTERACTIONS BETWEEN KINDERGARTEN CHILDREN IN A FREE PLAY SETTING

by

© PETER KENNETH JENSEN

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

OF DOCTOR OF PHILOSOPHY

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FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled "Increasing Cooperative Social Interactions Between Kindergarten Children in a Free Play Setting," submitted by Peter Kenneth Jensen in partial fulfilment of the requirements for the degree of Doctor of Philosophy in Physical Education.

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ABSTRACT

The main focus of this research was to determine the effects of cooperative games' participation on the nature of social interactions among kindergarten children in a free play setting. This problem was dealt with in two phases. The first phase was a critical review of theory and research and the evolution of tools necessary to conduct a natural experiment examining the effects of a cooperative games program on children's free play social behavior (the second phase of the research). The major portion of this research was the use of this interaction instrument to ascertain as to whether or not a cooperative games playing program had any influence on the type and the extent of social interaction between the children in a free play setting.

The subjects for the study were thirteen children (3 years 10 months to 5 years 10 months of age) enrolled at the University of Alberta Elementary Education Kindergarten. The studies utilized an ABAB design. During the experimental phases of the program the children were given daily classes in cooperative games immediately prior to their free play period. The children were videotaped twice weekly in their free play period throughout the eight week duration of the study. All videotape free play sessions were conducted in the same play environment, an extensively equipped playroom.

The results of this experiment clearly indicate that the games program had an effect on the overall amount of cooperative play observed in the subsequent free play setting. It is also evident that two of the four categories of cooperative play outlined in the interaction instrument designed to analyze the children's free play, accounted for most of this change. These categories are labeled Associative Play and Task Coordina-

tion. When the game playing experimental condition was withdrawn, there was a subsequent reduction in the amount of cooperative play observed.

During the final phase of the experiment, the cooperative games were re-introduced and a subsequent rise in cooperative play during the free play periods was observed, thus establishing a link between the games and the observed increased cooperation in the free play setting.

The results of the experiment were discussed for the group as a whole, as well as for each individual, and an overall interpretive statement, as a result of the findings by way of a response to 3 research questions posed in the first chapter, was presented.

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First and foremost, the author expresses his sincere thanks to all the children who participated as subjects in this study and the two pilot studies. These play "experts" are mostly responsible for what little insight the author has gained into the world of children's play.

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The author dedicates this thesis in memory of his father, Anker Jensen, who provided silent inspiration.

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CHAPTER I

INTRODUCTION

> The spirit of playful competition is, as a social impulse, older than culture itself and pervades all life like a veritable ferment. Ritual grew up in sacred play; poetry was born and nourished on play, music and dancing were pure play. Wisdom and philosophy found expression in words and forms derived from religious contests. The rules of warfare, the conventions of noble living were built up on play-patterns. We have to conclude, therefore, that civilization is, in its earliest phases, played. It does not come from play like a babe detaching itself from the womb; it arises in and as play, and never leaves it.
>
> (Huizinga, 1950)

The above quotation by the Dutch historian Johann Huizinga is one of the strongest arguments made for the importance of play in civilization. His argument is logically and persuasively presented although it has not been broadly accepted. Anthropologists, sociologists and psychologists have presented more empirical evidence supporting the importance of play behavior. Indeed, many have suggested that play is the key element in the socialization of the child.

It follows that much can be learned from a culture through study of the types of games and play found within that culture. A dramatic and oft cited illustration of dominant cultural values manifest in the play-sport sphere is that of American football. "If one wanted to create from scratch a sport that reflected the sexual, racial and organizational priorities of the American social structure, it is doubtful that one could improve on football" (Real, 1976, p. 25). An analysis of the game of football suggested a particular use of territo-

riality, property, time, labour, management, physical contact, motivation, infrastructure, packaging, game, and spectacle, all functional to the larger society. Professional football, hockey, baseball, and other sports have served as a model for minor leagues throughout North America.

The heavy emphasis on achievement at the professional level has also influenced the development of neighborhood sports programs. This high emphasis on achievement has led to much violence in minor sport (Smith, 1975). The German sociologist Luschen has singled out high centrality of achievement within the sports system as a dysfunctional element for the host culture.

> It has such a high rank in the hierarchy and values of sport that by definition, the actual objective performance of a member of this system will decide the status he gets. In the core of sport, in the contest on the sports field, there is only achieved status. It seems that there is no other system or societal subsystem, with the exception of combat, where achievement ranks that high. It may create conflict once this value-orientation is imposed on the whole culture, and it may create conflict within the system sport itself since its members bring other values into the system as well (Luschen, 1967, p. 32).

Certainly the over-emphasis on achievement is not the only dysfunction of sport. Another is raised by W. Adorno (1957) who calls sport an area of unfreedom. He refers to the abundance of rules within sport, the regimented style of play that currently exists in many games, and the fact that sports are organized and run by adults who make all decisions from the starting lineup to the calling of plays. In his view adult over-control tends to strangle much of the fun out of sport by imposing these rules, traditions and grandstand pressure. Much

attention has been focussed over the past few years on the problems in minor league sport - t.v. documentaries, newspaper articles, and full length movies. Tutko (1976) and Smith (1976) best sum up feelings on the matter:

> I'm not against competition. Everybody likes to win, but there is a vast difference between competing for the fun of competing, and regimenting everything with only one goal in mind -- to produce an elite champion (Tutko, 1976, p. 56).

> This discussion is not intended to suggest the elimination of competition. It is intended to advocate more emphasis on cooperation, less forcing of children into competitive situations, and a critical examination of the real effects of competition to try to have it serve more constructive ends than it has in the past (Smith, 1976, p. 8).

"If you want to know what a boy is, watch his play; if you are concerned with what he will become, guide his play" (Anonymous). A child has many needs that can only be met through play. People generally, and children in particular, may feel the need without being able to formulate it into words. The infant or the child cannot tell us in words what it is that he is in need of. Nevertheless he has needs that must be met if he is to develop healthily and he is dependent upon adults to interpret those needs correctly (Schmidt, 1973, p. 48). Certainly if play and games are as important in the socialization of the child, as many believe them to be, it is imperative that all children have the opportunity to participate in them, and that the values reinforced and nurtured within the game environment be those considered to be important to the child's full development.

It should be noted, however, there have been many positive steps

towards rectifying the situation within minor sport as it exists today (e.g., the timed lines in houseleague hockey being one such implementation). Murray Smith (1974) has suggested that there is widespread confusion as to what the objectives of a sports program are and that by classifying sports environments by participant objectives we could alleviate many of the negative experiences in sport for both the participant and the well meaning lay volunteer. Another alternative is to change the competitive emphasis within games to a "non winner" cooperative one.

Charles Darwin, among others, clearly maintained that for the human race the highest survival value lay not in competition but in intelligence, a moral sense and social cooperation (Leonard, 1973). Hans Selye (1974) has pointed out that even at the cellular level, cooperative adaption is the most successful route to development as well as survival. Ashley Montagu has gone so far as to state that "the evidence strongly indicated that, in the social and biological development of all living creatures, the drive to cooperate is the most dominant, and biologically the most important . . . there is not a thread of evidence that man is born with hostile or evil impulses which must be watched and disciplined" (Montagu, 1966, p. 41, 44).

Glassford, Scott (1977) and others have pointed to the Canadian Eskimo culture as an example of cooperative existence. They have also documented many of the traditional Eskimo games, and it is evident that these games, almost entirely cooperative in strategy and content, are a primary tool in the socialization of the youth in the Eskimo culture. Terry Orlick (1977) has taken many of the traditional Eskimo games and

modified many current games and come up with a variety of cooperative games. In a three year project at the kindergarten level, he has shown that after an 18 week cooperative game program kindergarten children would spontaneously exhibit more cooperative behavior during unstructured free time in the kindergarten classroom (Orlick, 1977). If indeed games can be used to modify children's behavior, and cooperation in the larger social milieu as Selye and others suggest is essential to survival, it follows that an extension of this work begun by Orlick should be of vital concern to those involved in physical education and recreation.

In summary, Montagu (1966) and others have suggested that the lack of emphasis on cooperation in the socialization of young children is a major factor in many of the current social problems. Cooperation will become increasingly more important in the years ahead as it may possess the greatest potential for the survival of the individual and the species (Montagu, 1966). Because cooperation, like competition, is primarily a learned behavior, efforts must be made to teach it. Physical educators have long promoted play and games as "value" builders but precious little research has been done to show that play and games have any value other than that they are fun and are sometimes beneficial to the child's physical health. There are many, as yet mainly untapped, opportunities for teaching cooperative behavior in the physical education program.

Statement of the Problem

The main focus of this research was to determine the effects of cooperative games participation on the nature of social interactions among

kindergarten children in a free play setting.

This problem has been dealt with in three sub-problems.

(1) The first sub-problem investigated was a critical review of instruments used to describe and categorize children's play and the development of an instrument for the express purpose of describing the free play social behavior of kindergarten children.

(2) The second sub-problem utilized the instrument developed to describe the free play social behavior of 13 kindergarten children.

(3) The third sub-problem was to utilize the instrument to describe free play social behavior of kindergarten children following a cooperative games playing experience.

More specifically, the following research questions were investigated.

(1) What are the play patterns of kindergarten children, and what is the nature and level of cooperative play?

(2) What is the relationship between cooperative, competitive and individualistic free play behavior?

(3) What is the nature of the effect of a cooperative games playing experience on the free play behavior of children?

Justification of the Study

The justification for conducting a study to analyze the effects of a cooperative games program on free play interaction between children

has been outlined in the introduction. The justification for doing this particular study using an interaction analysis instrument, VTR recording methods and an ABAB design will be outlined here.

A review of the work done by Orlick and a pilot study conducted by this author (Jensen, 1977) have outlined some inadequacies in measuring changes in children's behavior following a cooperative games program. For this reason this current study proposes to develop an instrument which might give a more complete and accurate description of the interaction that occurs between children in a free play setting, and to video the interaction so as to facilitate a more thorough analysis. An ABAB design was proposed so that it might be possible to ascertain whether or not the cooperative games program is, in effect, the variable that changes the nature of the interaction (if changes do occur).

By reducing the size of the sample (N - 13) from the pilot study (N = 60) it is hoped a more thorough analysis in terms of an increase in the number of observations per child as well as a more detailed analysis of each child's background - family life, etc. - can be made. This will hopefully lead to a more thorough understanding of the impact of the games program on the interaction between the children.

Organization of the Thesis

In the chapter that follows, studies concerned with increasing cooperation in children and studies of concern to children's free play behavior will be reviewed. Chapter III (1) outlines the evolution of the instrument to analyze the children's free play behavior, (2) defines each category and (3) presents information on its use and how interrater

agreements were calculated.

The fourth chapter contains methods and procedures for the cooperative games free play experiment. The results of this study are presented and discussed in the fifth chapter. An interpretation of the experiment results - by way of the three research questions posed above - is put forth in Chapter VI.

The final chapter, which has a section on implications for further research, is entitled "Summary and Conclusions".

CHAPTER II

PLAY AND SOCIAL INTERACTION BETWEEN YOUNG CHILDREN

General Introduction

The first section of this chapter very briefly makes the case that play is important and thus worthy of investigation. The argument that play is worthy of investigation need no longer be made - as the vast amount of research now available indicates. It is considered sufficient to make the point, acknowledge some of the more prominent scholars, past and present, who have established the case for play and proceed to the second section. This section will examine the nature of the interrelationship between cooperation and competition as it bears on this piece of research. A third and final section will examine studies that have concerned themselves with increasing cooperation among children, as that is essentially, the main purpose of this study.

Play and Socialization

Psychologists have long been aware of the importance of play in both diagnosis and treatment of child psychological problems. It has been argued by many that play provides insights into the child's personality. It certainly should not be taken for granted that people play merely because it is fun. "Any position that holds that pleasure and play lies in doing something for its own sake simply skirts the issue of a very complicated problem. We can certainly accept the child's statement that he plays because it is fun or because he likes it,

but we cannot contend that this explains play or even certain kinds of play." (Alderman, 1974, p. 25).

The psychoanalytic, behavioral and cognitive schools of psychology all recognize the important role of play in the socialization of the young child. Jean Piaget (1962), the famous Swiss developmental and educational psychologist, in particular has conducted a thorough investigation of play. He was primarily concerned with the intellectual development of children but found that it was so closely bound up with play and games that he soon had to study these as well.

Many other scholars of high repute have investigated the role of play in the socialization process. Eifermann (1971), El'Konin (1966), Ellis (1973), Gilmore (1966), George Mead (1934), Miller (1941), and Sutton-Smith (1966), have all contributed greatly to the understanding of play and its role in child development. Sigmund Freud, the father of psychology, gave play a prominent role as an outlet for the tensions and anxieties that developed during social frustration. But it is a 4 year old girl, Tracy Gunsch, who shall be given the role of summing up this brief introduction on the importance of play. Tracy Gunsch won an essay contest with her work "I like to play games because...". The Edmonton Journal headlined the article "Games are Played for Important Reasons" (Edmonton Journal, March 6, 1978).

> Most people like games, and I know I'm one of those people. To me, there has always been four types of games. The first is the team games like hockey, baseball, basketball and volleyball. The next in line are the kinds of games you buy in stores. I also like to play the individual or small group games. You know, people play games from the time they are babies, all the way up to when they are

100 years old. No matter what age a person is, games are played for important reasons.

I remember when I was five and my brother was two, we used to make up our own games. One of our favourites was to pretend that the couch was our truck, and we were married and out searching for a place in the world to spend our lives. We'd then have children, and everything else we could dream up. Playing games then, helped me greatly in using my imagination.

Playing games also helps me understand the friends that I have even better, and to turn strangers into good friends. I learn to care for myself and others, to know and understand myself better, and to learn and know the way to act with others. Playing games has helped me learn many things that I know, and it will probably help me learn a great many more things as I grow older.

Games make me think hard, and concentrate, too. They teach my brain to think hard and often. Playing games also relaxes me. If I get ten right out of twenty on a test in school, I feel badly. However, if I then go to gym class and have a game of floor hockey, I find it doesn't matter if we win or lose, as long as I try my hardest. When I come back to class, instead of being angry at myself over the test, I start thinking that it really isn't that bad. I tried my hardest. Now, how can I improve?

Games are very good for my body and health. They give me the exercise that I need to stay fit. Games provide a challenge for me and my friends. They keep me fit and trim like I like to be.

When I think of all the reasons why I like playing games, the number would be large, but they all fit under two different groups. First of all I play games to learn the good things in life. These things include self respect, fun, challenge, sharing, and co-operating. The other thing I like about playing games is to learn from the bad things. I hate things like cheating, hurting, disrespect and tempers. For these reasons, games will be important to me, no matter what my age is.

Competiton and Cooperation

This current research was concerned with social or cooperative play in children. Before reviewing studies that have concerned themselves with

increasing cooperation between children, it will first be necessary to examine the relationship between cooperation and competition. Within general layman usage, the terms are often perceived as opposites and yet a closer examination reveals that very often they are closely aligned. In team sports, for example, members on one unit cooperate to compete against another and indeed, the two teams must cooperate to the extent that they agree to play at a certain time, at a certain place, under certain rules.

Perhaps the most thorough examination of competition and cooperation in society is contained in a book edited by Margaret Mead (1961). This excellent work looks at competition and cooperation among primitive people through the examination of 13 tribes ranging from Indian groups on Vancouver Island to the Eskimo of Greenland and the Maori of New Zealand.

Mead considered four possible conclusions concerning competition and cooperation. The first was that competitive and cooperative behaviors would be responses on the part of the human organisms to a situation which was set up by the natural environment itself. This was primarily based on the hypothesis that man was a creating organism who would compete with others only if it meant the satisfaction of the desire for an object for which there was limited supply (Mead, 1961, p. 15). The second consideration was that such things as competitive and cooperative habits are fixed by the nature of the technology, so that if a certain piece of apparatus is such that it requires many people to be functional, such cooperative behavior would transfer over into other aspects of people's lives where these factors do not operate.

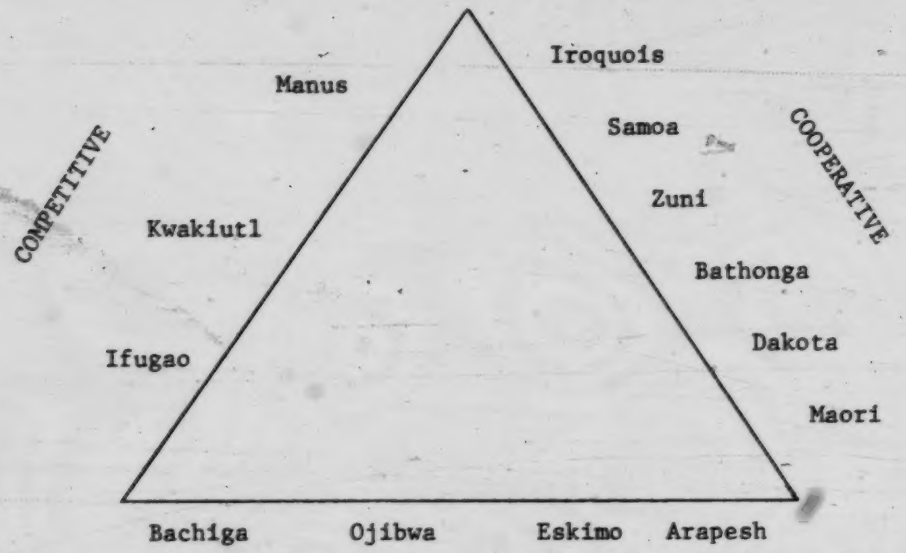
The third consideration was that the social structure of the society was the most dynamic factor that governed how individuals within that society related with each other.

A fourth suggestion was that the educational system would be the determining factor, and that by examining it, one could ascertain whether or not a competitive or cooperative character structure was formed (Mead, 1961, p. 15). As the group of researchers who conducted the 13 studies worked with these assumptions, several things became clear.

> "In the first place, we found it necessary to emphasize that the terms cooperative and competitive were not opposites as they are so loosely used in popular speech. To make our analysis complete we had to add a third category which we called individualistic behavior, that is, behavior in which the individual arrives towards his goal without reference to others." (Mead, 1961, p. 16).

The results of the study are most interesting. First, it was discovered that no society was exclusively competitive or exclusively cooperative. There were some very highly competitive groups, but the very existence of this high competition implied cooperation within the groups. Mead suggests that "both competitive and cooperative habits must co-exist within the society" (Mead, 1961, p. 460). Another point was that competition did not necessarily mean conflict, or for that matter cooperation solidarity. She pointed out that the Maori strove to outdo one another in bird snaring and were publicly honoured for success, but that the cooperative distribution of the catch was not affected, and that the rivalry in fact only served to create higher productivity (Mead, 1961, p. 460).

Perhaps the most interesting outcome of the study was the triangular relationship between competition, cooperation, and individualism that the analysis of these 13 cultures seemed to suggest.



(Mead, 1961, p. 461)

The above diagram shows where the 13 systems can be arranged in terms of their orientation towards individualism, cooperation, and competitive emphasis. The mid-point on each side of the triangle is taken as the most intense development of that emphasis, while places near the corners stand in a more intermediate position (Mead, 1961, p. 461).

A closer examination of the 13 cultures indicates that there is no relationship between subsistence level and the major emphasis within a culture. All individualistic societies are not found at a low subsistence level, for example. The second point is that there is no relationship at all between the classification of cultures into hunting or agricultural

peoples and the major emphasis, and there is no correlation to be found by culture area. The technology of a given people seems to have little to do with their orientation. Mead cites the example of large fishing trap fences that were used by several primitive people. The Manus fitted these fences into small partnership patterns, whereas the Samoans used the same fishing method as the basis for a village-wide participation in cooperation (Mead, 1961, p. 463).

In summary, it is clear that there is no set pattern that determines competition or cooperation. It is not the technology nor the natural environment, nor the abundance or absence of game. Rather, it appears...

> that competitive cooperative behavior on the part of the individual members of a society is fundamentally conditioned by the total social emphasis of that society, that the goals for which the individuals will work are culturally determined and are not the response of the organism to an external, culturally undefined situation, like a simple scarcity of food. (Mead, 1961, p. 16).

Although it is risky to generalize from a study of 13 primitive societies to a complex industrial society, one can say that the goals for which individuals in a society work are culturally determined and result from the social emphasis of that society.

Review of Studies Concerned with Increasing Cooperation

Introduction

Very few studies have been conducted which actually concern themselves with increasing cooperative social interactions between children in free play settings. There have been, however, several studies which

have attempted to look at social participation in pre-school children in the play environment. There are also several excellent studies that describe the types of interactions occurring in the free play setting.

Perhaps the classic study in this area was conducted by Mildred Parten more than 45 years ago. Parten (1932) carried out a study that was specifically designed to collect play norms for groups of pre-school children between the ages of 2 and 4. She established six categories of play behavior: (1) unoccupied, (2) solitary, (3) on-looker, (4) parallel, (5) associative, and (6) cooperative. Barnes (1971) conducted a replication of the Parten study which indicated that there has been a substantial reduction in social play behavior in the last 40 years.

> "If the present findings are representative of typical 3- and 4-year old pre-schoolers of today, then the data indicates that children in 1969 are much less socially oriented in their play activities than were their contemporaries of 40 years ago.
>
> The findings are remarkably consistent in supporting this viewpoint, for both 3-year olds and 4-year olds. Even 5-year olds were much less social in their play, with the exception of associative behavior, than were the 4-year olds in Parten's study." (Barnes, 1971, p. 100-101).

Certainly one must be very cautious when comparing studies done 40 years apart, but the point remains that when compared with the play norms established by Parten, the children tested by Barnes were much less socially oriented in their play behavior. There can, of course, be many reasons for this. A decrease in family size, an increase in television

viewing, and a greater percentage of working mothers, are but a few possible explanations for this behavior. The important point, however, is that there is an indication that there has been a reduction in social play behavior.

> "Whatever the reason, it is suspected that preschoolers on entering Grade I class situation, are less socially skilled in engineering associative and cooperative play activities than were their contenporaries in the late 1920's. Perhaps this is one of the precipitating factors for Fromm's (1955) observation that man is becoming more and more alienated with his society." (Barnes, 1971, p. 102)

A study by Clark, et al (1969) made use of the sociogram to examine both the intensity and the extensity of social interactions between children in a free play setting. Their results clearly indicate that there was very little cooperative social interaction within the free play setting.

McClintock, et al (1977) investigated variations in individualistic, competitive and cooperative behaviors at two age levels in nursery school children. The two age levels compared were 3 1/2 to 4 1/2 years of age, and 4 1/2 to 5 1/2 years of age. The results indicated that nursery school children were primarily "own goal" oriented, and that there was no increase in cooperation - as measured in the coordinative task designed by researchers - as a function of age, but that there was a sharp increase in competition in the competitive task as a function of age. When these results were compared with the results of an earlier study by McClintock and Moskowitz (1976), a definite decline in cooperation as measured by a coordination task was indicated from the ages of 3 1/2 through to 8 1/2 years of age, while there seemed to

be a sharp increase in competitive responses as measured in a conflict task as children grow older.

They summarize the results of the two studies:

> "Overall, the findings of the two studies are consistent with four major expectations outlined initially. Very young children are principally own-gain oriented. In their own words, they 'wanta get lots' of whatever outcome is afforded them. As they grow older they learn to make choices in conflict and coordinative tasks that are consistent with achieving valued own outcomes. The acquisition of appropriate competitive choices occurs earlier, between four and five years of age, than the acquisition of cooperative ones, between six and seven years of age. Finally, between the ages of five and six, children begin to make choices in the individualistic task that indicate that children at times are willing to forego own-gain for a competitive advantage. This would imply that competition is achieving the status of an autonomous social motive." (Mclintock, Moskowitz, and McClintock, 1977, p. 1085).

All of these studies clearly indicate the low level of cooperation in the free play setting. The next section will examine studies that may provide vital information concerned with increasing cooperation between children in a free play environment.

The first few studies (Azrin and Lindsley, 1956; Cohen, 1962; Cohen and Lindsley, 1964; Lindsley, 1966; Mithaug, 1969; and Stewart, et al, 1971) outline attempts by Behaviorists to establish the basic principles for developing and maintaining cooperation. The study that follows these by Altman (1971) is of great importance to this research as he investigates the question of generalization of a "laboratory learned" response to the free play setting.

Sherif's (1956) work on cooperation and competition in a summer camp, and Aronson's (1975) "The Jigsaw Route to Learning and Liking",

are well known "classics" and are of concern here because they were conducted in a "natural" setting (i.e., camp and a classroom environment).

The remainder of the studies are attempts at increasing cooperation in a free play setting and therefore are of particular concern. The use of contingent reinforcement and peers's attention as a basic reinforcement is also examined.

The final work, that of Terry Orlick (1977), is most important because it provides the basis for this research.

Increasing Cooperation

Nathan Azrin, and Ogden Lindsley (1956) investigated the problem of whether cooperation between children can be developed, maintained and eliminated solely by the presentation or non-presentation of a single reinforcing stimulus available to each member of the cooperative team following each cooperative response. The ten pairs of cooperative teams were selected randomly by volunteering in response to the question "Who wants to play a game?". The only other control was in matching for age and sex. There were seven male teams, three female teams, and the ages ranged from 7 to 12 years. The experimenters guaranteed cooperation by using an apparatus that required group behavior to operate, and required one child to respond to the other child to produce reinforcement. The object of the "game", for each team, was the placing of each child's stick into all three holes which faced each child on his or her side of the table. The children were seated facing each other. When such a cooperative act was performed by the team in .04 seconds, a red

light flashed and a single jelly-bean fell into a cup on the table which was available to both children.

The experimenters applied reinforcement for 15 minutes, followed by 15 minutes without reinforcement and finally, an additional 15 minutes of reinforcement. All of the teams learned to cooperate within the first 10 minutes of the experiment without having been given any specific instructions. Observations noted the development of a dominant child within the team, and 8 of the 10 teams divided the candy in varying ways. With two of the teams, however, one child took all of the candy until the other child stopped cooperating. Consequently, they were forced to reach a verbal agreement whereby the candy was shared.

Rates of cooperation acquisition varied across the teams and there was a gradual group extinction curve which corresponds to individual extinction curves. Further, reacquisition of cooperation with the second reinforcement was almost immediate. Without reinforcement, cooperative responses dropped significantly. Experimenters therefore were able to conclude that operant conditioning can be used to initiate, maintain and eliminate cooperative behavior between children.

B.F. Skinner (1953) labelled Azrin's and Lindsley's study as essential, because it established in human behavior the principle that cooperative behavior is acquired when it is reinforced and it can be extinguished when the reinforcers are terminated.

Later work by Cohen (1962), Cohen and Lindsley (1964), and Lindsley (1966) investigated the cooperative and competitive processes

still further. They identified rather inter-personal responses and events that affect the rates of occurrence of these responses. Mithaug (1969) examined the effects of reward contingencies on cooperation. He found that when rewards for achievement on interdependent tasks were greater than rewards for accumulating points on an individual counter (the independent task), group members cooperated, coordinating their responses to produce points at a higher rate on the group counter (Stewart, Zelman, and Mithaug, 1971, p. 463).

Following up on these studies, Stewart, Zelman and Mithaug (1971) investigated the effects of different competitive contingencies on cooperative behavior. The study involved three distinct phases. In the first phase, the effects on task rates of rewards contingent upon achieving a task rate equal to a prescribed standard were investigated. In the second phase, they investigated the effects of surpassing another group's task achievements, and in the third, the effect on group task rates of rewards contingent upon different comparison outcomes. They concluded that "when rewards are contingent upon a higher comparison outcome, group task rates increase, and when rewards are contingent upon a lower comparison outcome, the rates decrease" (Stewart, Zelman, and Mithaug, 1971, p. 478). The data clearly support the proposition that task achievement rates in three person cooperative groups are a positive function of the competitive contingencies.

It has been shown that a cooperative response between two or more individuals can be brought under the control of both continuous and partial reinforcement (Azrin and Lindsley, 1956; Cohen, 1962; and

Cohen and Lindsley, 1964). The question of generalization of this learned cooperative response to situations outside the laboratory is of particular importance for those concerned with increasing cooperation in the free play setting. Altman (1971) investigated the effects of a cooperative response learned in a laboratory situation on social behavior during free play of 20 nursery school children between the ages of 3 and 6 1/2 years of age. The cooperative response was learned on an apparatus which consisted of a pair of yellow and green lights on a table with four levers, at which subjects sat facing each other. In the centre of the table was a buzzer which served to tell the subjects that a correct response - that is, a cooperative response - had occurred and that the reinforcement would follow. Every time a cooperative response occurred, each subject received a small M & M. The author used technique discussed by Marshall and McCandless (1957) to record and classify the children's behavior. Behavior was observed during spontaneous play and categorized under one of four headings: association, friendly approach or response, conversation, and hostile. Altman summarizes the findings.

> "Thus, cooperative response acquisition appears to enhance the positive effects (i.e., increase the friendly approach in the associative response frequencies and descreases in hostile response frequencies) of experimental exposure per se on interaction with experimental partners during free play." (Altman, 1971, p. 393).

He therefore concludes:

> "This study demonstrated that a social response (cooperation) learned in a laboratory setting influenced the nature and frequency of social interaction in an extra-laboratory situation (free play)." (Altman, 1971, p. 394)

One of the more interesting studies in the area of competition and cooperation was conducted by Sherif (1956), and a subsequent investigation in 1971, was conducted by Sherif et al (1971). These studies led to a more thorough understanding of conditions which lead to harmony and conflict. The earlier experiment was conducted in an isolated summer camp for 12-year-old boys. Conflict was introduced by setting up a series of competitive activities where one group competed against the other. Initially, good sportsmanship prevailed; however, this soon changed to a situation of hostility. The cooperation within the groups became stronger but it was obvious that intergroup cooperation did not exist.

Once this high level of hostility had reached a peak, Sherif stopped the competiton, but, not surprisingly, the hostility which had developed between the groups remained. He attempted to reduce the hostility by establishing "super-ordinate" overriding goals which had appeal to both groups. The tasks were such that the two groups had to get together and cooperate in order to reach their end goal. After many of these cooperative enterprises, friction and conflict gradually reduced and harmony developed which spread to all areas of interaction between the boys.

Sherif was able to reduce the hostility and increase cooperation and friendship between the children by placing them in situations where they were mutually dependent. He concluded that "when two groups have conflicting aims (i.e. when only one can achieve its aims at the expense of the other), their members will become hostile to each other

even though the group are composed of normally well adjusted individuals" (Sherif, 1956, p. 57). Orlick, in reaction to this study, points out that "an important revelation coming out of this research is the fact that in the final analysis interdependence, cooperation, and harmony among the children was not achieved as a result of one team or one individual being rewarded for another's defeat, but rather, through common goals which were shared by all" (Orlick, 1977, p. 27).

Aronson (1975) was concerned about a different type of conflict, that of racial tension caused by busing. He introduced what he called "the jigsaw route to learning and liking" into elementary school classrooms to try to reduce this conflict. The main aim of the project was to change the process of education so the children would no longer be competing against each other, and would be forced to use each other as resources. The technique is based on the principle of a jigsaw puzzle. Each child has a piece of information and all members of any group, usually five to seven in number, must cooperate in order to put the puzzle together.

Initially, the students were not particularly cooperative, but soon they began to realize that they had to rely on the other students for the information in order to meet the group assignment. Aronson took great care to avoid the Hawthorne effect by informing all the children, including the control group, that something new was going to be tried. Both groups responded to the same set of standards at the completion of the pilot project. Aronson had started on a small scale. The experiment took place for only one hour a day for two weeks, the experimental group

using the jigsaw method and others learning in the traditional way. The entire experiment was then repeated in a grade six classroom in a different school in another neighbourhood.

The results for both studies were essentially the same. The jigsaw puzzle method was in no way inferior to the traditional method of learning, but it added a big plus in that it was much superior in fostering group affection and friendship. Similar results were found the following year, when ten teachers agreed to participate in another experiment.

The classes consisted of 177 anglos, 76 blacks, 41 chicanos and 2 orientals. For this experiment, precise measures were taken as to the effectiveness of the jigsaw method. Several students were trained to observe the groups at work. The research was conducted over a six-weeks period.

In an analysis of the results, the children in the jigsaw group liked their peers more at the end of six weeks than those in the traditional classroom. Students in the jigsaw group saw each other as learning resources, whereas those in the traditional classroom did not, and the overall attitude towards school of children in the jigsaw method was superior to that of those in the traditional classes.

One final analysis showed that those in the jigsaw group had stronger and more positive self concepts at the end of the experiment, and that their self-esteem had, in fact, improved.

Many researchers have been concerned with the almost complete lack of cooperation among children in the play environment. Knapczyk and Yoppi (1975) attempted to increase cooperative play responses in developmentally disabled children. Similar work was conducted by Hingtgen Frost (1966) in an attempt to increase cooperative responses in early childhood schizophrenics. Perhaps a more significant study for this research is the work of McCandless and Hoyt (1961). In their 1960 study of sex ethnicity and play preferences of pre-school children, they indicated that there was a significant difference in playmate selection between cross sex as opposed to own sex partners. That is, boys spent more time playing with boys and girls with girls. Serbin, et al (1977) conducted a study aimed at increasing cooperative cross sex play. Classroom teachers used contingent praise to reinforce cross sex cooperative play in two nursery school classes. There was a significant increase in both classes of cooperative cross sex play as a result of the experiment. The study used an ABAB design and the removal of treatment resulted in reversal to previous levels of cooperation when the teachers did not deliberately reinforce play between boys and girls.

The study by Serbin, et al (1977) clearly indicates that some form of specific contingent reinforcement is essential to the increasing of cooperative cross sex play. Hart, et al (1968) studied the effect of social reinforcement on the cooperative play of a 5 year old girl in pre-school setting. Under one condition the girl was reinforced randomly

throughout the school day, whereas in a second condition reinforcement was presented contingent upon cooperative play. Only in this latter condition was there any significant change in cooperative play observed. Wahler (1967) investigated peer group reinforcement in free play settings. His results demonstrated that the pre-school child's behavior was subjected to reinforcement control of his peers.

The subjects were five children and members of their pre-school peer group ranging in age from 5 to 6 enrolled in a nursery school. The five subjects were randomly selected from the class and two other randomly-selected playmates served as the subjects' peers. Each subject was put in a special playroom that was designed for observation and left for 15 minutes along with their peers. The peers were then told to ignore the particular behavior that was to be extinguished or, in some cases, to pay particular attention to other response classes. These response classes had earlier been observed in a free play period in the same setting. With one subject, Eddie, cooperative behavior was selected for experimental analysis. There was a marked increase in cooperative behavior following peer attention, but the level of cooperative behavior dropped drastically once peer group contingent attention was stopped. Wahler describes the third phase of the research, the reinstitution of contingent attention:

> "Following E's instructions to resume their attention to Eddie's cooperative behavior, his peers were continuously attentive to this class, and, as expected, cooperative behavior increased in rate, while other response classes decreased. Thus, like Ss no. 1 and 2, Eddie's behavior showed evidence of peer reinforcement control." (Wahler, 1967, pp. 286-287).

Tiktin and Hartup (1965) investigated whether a response rate in a marble dropping task would increase when there were changes in the sociometric status of the peer who dispensed verbal reinforcement during that task. Very simply, peers were rewarded verbally by popular peers, unpopular peers, and socially isolated peers. The results showed a significant increase during testing sessions when the subject was reinforced by an unpopular peer. The rate did not change when the reinforcing agent was isolate, and, in fact, tended to decrease when the reinforcing peer was popular (Tiktin and Hartup, 1965, p. 306).

The most advanced work in the area of cooperation and games has been pioneered by Terry Orlick at the University of Ottawa. Over the past three years, he has directed his research towards the creation of a cooperative games program. His program was conceived as a means of social change directed towards more humane games and lives (Orlick, 1977, p. 2). The primary aim of the cooperative games as he saw them was to increase cooperative behavior both in and out of the games. The games that he has designed have been structured to provide cooperative success experiences, total involvement, as well as individual feeling of acceptance.

He has gone through many stages to arrive at the present structure. Firstly, he found it necessary to restructure many of the existing games in order to elicit the kinds of behavior that he was seeking. Some of the games he designed were new, others were old games that were adapted. The primary objective of these games was to provide opportunities for

cooperative learning and fun-filled interaction. He has pointed out that merely bringing people together does not ensure cooperation, but that it is necessary to link these people together in some interdependent way, and that the structure for the activity dictates the conditions for interdependence.

Some current sports already involve a great deal of cooperative independence among members. Volleyball, rowing, pair skating, and many other activities require cooperation among participants. These games can usually be modified to elicit cooperative interdependence within each team, and indeed, between teams, merely by rotating the players from one team to another. Another way of achieving the same goal is to establish rules which encourage members of opposing teams to cooperate. An example of this would be two teams trying to reach a collective goal or score. This method certainly is not new. Aronson (1975) used it to encourage cooperative group learning, and Sherif (1956) utilized this method to get hostile camp groups to cooperate.

Orlick arrived at various types of cooperative games and listed them under the following categories: cooperative games with no losers, collective score games, reversal games, semi-cooperative games, and cooperative cognitive and perceptual-motor development games. Sample games from Orlick's work in each of these categories can be found in Appendix C of this research.

In order for a game to be considered for inclusion in the cooperative games category, it had to meet three important criteria.

Firstly, there had to be active involvement for the participants. Secondly, the game had to be fun, and thirdly, of course, the game had to be of such a nature that it encouraged cooperative behavior. Activity level was measured by a 10 second scan early in the game, towards the mid point of the game, and towards the end of the game. During the scan count, the number of children not actively involved in the game were counted. The fun concept was measured through observations of verbal representation (i.e., laughter, shouting, cheering, etc.), facial representation (i.e., expressions of joy, open mouth, etc.), and gestures representing fun (i.e. stomping the feet, clapping the hands). With older children, the fun level was also assessed by having the children judge the game on a continuum running from a widely smiling face to a very sad face.

Measuring the amount of cooperative social interaction that the game elicited was somewhat more difficult. Observers were familiarized with cooperative behavioral definitions and a high reliability (over 90% agreement) between different observers was attained.

> "One method we have found to be successful in observing games is to randomly select one individual and count the number of cooperative acts he engages in over a 30 second period. A second individual is then randomly selected and observed for 30 seconds. This continues until the game is concluded. This information can then be analyzed to obtain an estimate of average number of cooperative acts engaged in for a particular game or period minute within a particular game. In instances where cooperation is continuous (e.g., log roll), the amount of time cooperating out of a 30 second period can be recorded in place of the number of cooperative acts. Another method we have used in games is to do a series of 30 second scans across the playing area. Following each scan, the observer notes the number of cooperative acts observed and/or the number of individuals engaged in cooperative behavior." (Orlick, 1977, p. 12).

Once Orlick had arrived at a catalogue of games which met his criteria (Appendix A), he proceeded to conduct a study to assess whether, as a result of cooperative games programs, young children would choose to engage in cooperative behavior in a kindergarten classroom. Subjects were four intact kindergarten classes from an elementary school in the Ottawa area. These 5 year olds attended school for half a day either in the morning or in the afternoons. A morning class served as an experimental group (N = 24) and the other morning class served as a control group (N = 25). Similarly, one of the afternoon classes served as an experimental group (N = 19), and the other as a control group (N = 19). The control groups were given what Orlick refers to as traditional games.

Two weeks prior to the introductions of the games program observers collected baseline observation data. This data consisted of cooperative social interaction measures taken during the free time period. The free time period consisted of children doing whatever they wanted to do for a 30-minute time period in the kindergarten classroom. Both the control and the experimental group were told that they were in a special games program. The games programs were introduced to the two groups by a qualified games teacher (from outside the elementary school) for an average of two 30 to 40 minute games periods per group per week for an eight week period. The experimental group engaged in cooperative activities, whereas the control group engaged in a combination of traditional competitive games and individual movement activities. After the eight-week period the games programs were taken over by the

kindergarten teachers for an average of four 30 minute game periods per group per week for an additional 10 weeks.

Post study observation data on cooperative social interaction was collected. All observations were done by "blind" observers. The observers did not know whether the subjects were in the experimental or in the control group, and were unaware of the nature of the specific experimental condition. Orlick used two measures of cooperative social interaction. The first measure utilized single observations of a 10 second interval nature, where either an I for cooperative social interaction or an N for no cooperative social interaction was recorded next to the child's name. The second method of observation was a group or continuous scan observation. A second set of blind observers, trained and checked for reliability, observed the children during a 30 to 40 minute unstructured free time period in the kindergarten classroom. Each observer scanned one half of the room in a slow and methodical manner, recording any incidents of cooperative behavior. "If a cooperative act was observed, the specific act, along with the number of children who cooperated in the act, was recorded. For example, if six children helped lift a bench, then 'lifting bench - 6 children' was noted." (Orlick, 1977, p. 24).

Orlick reports that the percentage of individual 10 second observation intervals where individuals were observed engaging in cooperative games group increases from 10.5% to 15.5%. He points out that this is an increase of 5 percentage points which represents a 48% proportional increase for the percentage of observable cooperative

behavior over the baseline. The combined control group's increase was much smaller, from 10.2% at baseline to 11.3% in the post tests. This only represented an 11% proportional increase over the baseline (Orlick, 1977, pps. 24-25). Measurements taken using the group or continuous scans observation, indicated that the cooperative games group engaged in an average of 43 observable incidents of cooperation per hour, whereas the control groups engaged in an average of 29. There were 46% more incidences of individuals engaging in cooperative behavior observed in the experimental cooperative games classes than in the control or traditional games group. "In conclusion, it is clear that on different days with different 'blind observers' utilizing different observation techniques, the same trend emerged." (Orlick, 1977, p. 28).

Orlick explored some possible reasons for these preliminary findings. He pointed out that children's cooperative efforts generally result in some form of success or reinforcement, and that when children are expected to cooperate to accomplish a task and are reinforced for this cooperation (through such things as goal attainment, control over the environment, feelings of acceptance, expressions of affection, positive social feedback, self-satisfaction, satisfaction with others and the environment) then one would probably expect to find increases in cooperative behavior at least within similar environments.

It follows that successful experiences in these environments increase children's overall repertoire in cognitive behavior, and that this can be drawn upon in different settings. But was the increase

in cooperative behavior during unstructured free time in the kindergarten classroom due to some generalization, or internalization of the overall value of cooperation, or was it due to the fact that there may have been some transfer in contingencies of reinforcement once the children had been seasoned within a cooperative environment?

Orlick cites one excellent example of the latter when he mentions that the games environment had helped children to learn to reinforce one another for cooperative behavior, and that future expectations and resultant consequences from peers should have been set in motion and maintained as new codes of acceptable behavior. In this instance, "the peers would become both models and mediators of a new response paradigm" (Orlick, 1977, p. 34).

During the second phase of the experiment, when the teachers also taught the games, there certainly could have been a transfer of reinforcement contingencies from the gym to the classroom. If a child is rewarded through praise for sharing in the gym environment, it certainly is conceivable that he would expect similar reinforcement within the classroom setting and that this expectation could serve to initiate a behavior, whether or not the expected reinforcement became a reality.

It is also true that once a behavior has been emitted, there are many forms of positive consequences that may help maintain it.

And finally, as Orlick points out, "it is possible that the jump from the cooperative games in the gym to cooperation in the kindergarten classroom is not as dramatic as it may appear at first

glance, due to the fact that a great deal of 'play' occurs in both settings, particularly during free time periods" (Orlick, 1977, p. 34).

CHAPTER III

DESCRIBING CHILDREN'S FREE PLAY: INSTRUMENTATION

Development of the Instrument

The apparent incongruity between play as a child directed "free" activity and the methodological problems of objective scientific investigation has presented a problem that all researchers who wish to deal with children's play behavior have had to contend with.

> In play research it seems that the requirements of the player and of science do not coexist comfortably. (Ellis, 1976, p. 133).
>
> .....regardless of one's perspective, the measurement of the 'play act' and its interpretation is an issue that permeates all approaches to the study of play behaviour. Whether the measurement technique is ethological or psycho-physiological, all raise questions of validity in their relation to the accounting of behaviours labelled play. (Wade, 1976, p. 17).

The first consideration for the development of a play interaction instrument was that it would not, in any way, interfere with the children's free play. It was necessary then, that observations be as unobtrusive as possible, and in order to avoid many of the problems outlined by Harré and Secord (1972), it was essential that any modification be made to the observation technique and not to the play behavior. The stance taken here and supported by the work of Harré and Secord (1972) was that any modification, however small, that interfered with the children playing normally would drastically change the nature of the behaviors and would not, in fact, be a study of children's free play. It should, however, be pointed out that within a normal play environment, such as the PREP playroom, there are some restrictions on the children for safety and space reasons. However, these were not considered unnatural.

The development of the interaction instrument was the result of a progression of events that started in the spring of 1976. At that time, the author visited with Dr. Terry Orlick at the University of Ottawa for a period of 3 days to acquire first-hand experience with Dr. Orlick's cooperative games research (Orlick, 1977), and to examine his methodology in operation. The purpose of Dr. Orlick's research was to ascertain whether or not there were increases in cooperative social interaction between children following his cooperative games program. Because of this, his instrument was a relatively simple one which recorded an 'I' should any cooperative social interaction occur during the 10 second interval, and an '0', should no interaction occur during the 10 second interval.

His detailed definition of cooperative social interaction included in it three distinct sections. The first was cooperative task behavior; the second, cooperative physical contact behavior; and the third, cooperative verbal behavior. Following these meetings with Dr. Orlick, the author returned to York University and in the spring of 1977 conducted a three month long pilot study using the Orlick methodology with one small modification. An 'N' was recorded opposite the child's name should he engage in what was termed negative social interaction during the 10 second observation period.

Following a review of many of the studies of concern to cooperative and play behavior (Lovaas et al, 1965; Smith and Connolly, 1972; Clark et al, 1969), and others concerned with identifying behaviors

(Reynolds and Guest, 1975) it was decided that a more detailed instrument was necessary in order to capture any small changes that might occur, and in order to give a more accurate description of each child's play behaviors.

The instrument, it was decided, then should be a description of the child's play as well as measurement of social interaction. One of the main reasons for the shift was to capture slight shifts or changes. Just as the child who spends all summer in swimming lessons and finally learns to be less afraid of the water and put his face in it, shows no progress if only swimming skill improvement is measured, so too the child that plays cooperative games and moves from onlooker to parallel player shows no increase in cooperative social interaction. If the instrument is not delicate enough to capture these small changes, then much of what is happening to the children's play as a result of the games program may be missed. Dr. Orlick's main concern was with social interaction and therefore his instrument is designed to measure cooperative social interaction. This study is concerned not only with social interaction, but also with children's play. It was decided therefore to combine the work done by Orlick on cooperative social interaction and the work done by Parten (1932) together with the negative social interaction category from the pilot study. As a final step, a one month pilot study was conducted in February of 1978, which analyzed game and play behavior during physical education classes in which the cooperative games were taught.

The purpose of this short study was to observe the behaviors the children engaged in when playing the games. A variety of the cooperative games were played with children from four grade levels (K to 3). The games were taught in two of the classes by the author and in the remaining two by the physical education teacher.

The three sections of Orlick's cooperative social interaction definition were then expanded to include behaviors found in the games so that independent and dependent variables might be more closely related.

Definitions of Categories

The final form of the instrument consisted of ten categories. The definitions of these categories combined those used in the pilot study (Jensen, 1977), Orlick (1977), and Parten (1932). Expanded definitions and examples for each category are found in Appendix B.

(1) Solo - Unoccupied Behavior - "The child is apparently not playing but occupies himself with watching anything that happens to be of momentary interest. When there is nothing exciting taking place, he plays with his own body, gets on and off chairs, just stands around, follows the teacher, or sits in one spot glancing around the room." (Parten, 1932, p. 249).

(2) Solo - Onlooker - The child is physically inactive. The child spends most of his time watching the other children play. This type differs from the unoccupied in that the

onlooker is definitely observing particular groups of children rather than anything that happens to be exciting. The child stands or sits within ten feet of the groups so that he can see and hear everything that takes place (modified from Parten, 1932, p. 249). This category also includes one child in casual conversation with another. The children may be standing or lying while talking to each other. No role playing is evident and no apparent activity results from the conversation.

(3) Solo - Independent Play - The child plays alone and independently with toys that are different from those used by the children around him. He pursues his own activity without reference to what the others are doing (modified from Parten, 1932, p. 250).

(4) Parallel Activity - "The child plays independently, but the activity he chooses naturally brings him among other children. He plays with toys that are like those which the children around him are using, but he plays with the toy as he sees fit, and does not try to influence or modify the activity of the children near him. He plays beside rather than with the other children. There is no attempt to control the coming or going of children in the group." (Parten, 1932, p. 250).

(5) Associative Play - The child plays with other children. All engage in a similar activity. There is a sharing of play materials and a taking of turns should a single toy or a piece of apparatus be involved. The key word here is with.

This category differs from the previous category in that the child is playing with the other children.

(6) Cooperative Assisting Behavior - One child shares play material with another or assists in the execution of a task. There is a definite division of labour with the children engaged with some particular task. For example, one child holds the rope for another while he/she gets on. The key word here is assistance (helping behavior).

(7) Cooperative Physical Contact Behavior - Two or more children engage in physical contact of an affectionate nature. For example, linking arms, holding hands, placing arms around one another, embracing, kissing, or patting another child on the back (Orlick, 1977, p. 7).

(8) Cooperative Task Coordination - The emphasis here is on performing a single task together, (i.e., lifting a block), working together for a common goal, (piling bean bags), or performing a coordinated action. Examples of behaviors that fall into this category are - (1) a child imitates another, (2) two children lift and pile large boxes to make a tunnel, (3) one child carries another child, (4) any type of coordinated role playing.

The key word here is task. There must be a definite task involved, otherwise the behavior is recorded as category (5) - Associative Play (modified from Orlick, 1977, p. 7).

(9) Negative Social Interaction - Any uncooperative behavior that interferes with a child working on his own task. It may be of a physical nature (pulling, pushing, fighting over toys, etc.) or of a verbal nature (arguing, disruptive criticism, etc.). Examples of this type of behavior are (1) mocking, (2) taking toys away from other children, (3) hitting another child, (4) keeping an object from another child.

(10) Competitive Play Behavior - One child competes with another child or children over an object (i.e., pulling a rope, chasing a ball) or one child is pursued by another or tries to beat another in the performing of the task. Examples are (1) tug-of-war with a rope, (2) races, (3) chasing a puck or a ball around the room where the object is to see who gets the ball first, (4) any form of keep away, (5) wrestling and combat activities, (6) any form of dodge ball.

This category differs from category 9 in that the children involved are so of their own initiative and are playing with other children. There is an element of fun evident in their play.

Use of the Instrument

Data Collection

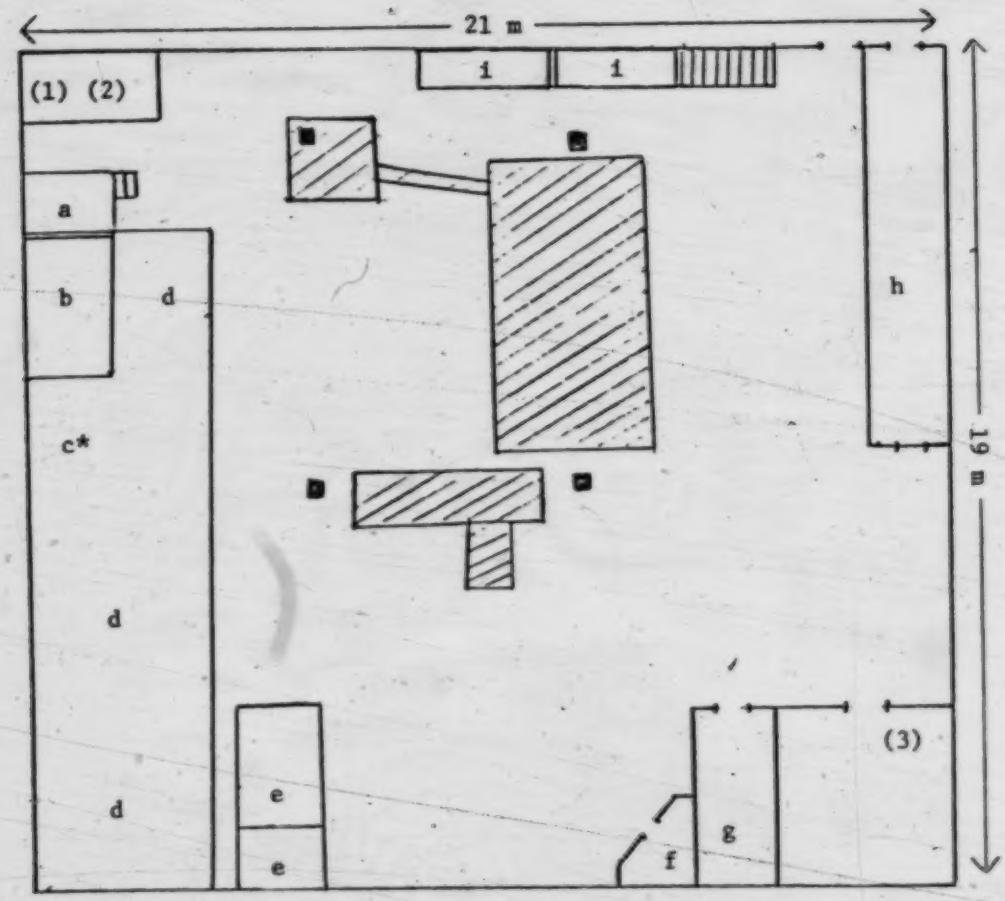
Videotape filming was used because it was felt that there would be less interference with the play of the children than with classroom

observers, and that a more thorough examination of the play interactions could be made from the tapes than from observer records. Three VTR cameras were used. The two main cameras were located in one corner of the PREP room (see Diagram 1) which was partitioned off so that only the tops of the cameras were visible. A third camera was located in the office directly across from the slide area, and filming was done through the glass in the door and was totally unobtrusive. At no time did the children appear to pay any particular attention to any of the cameras in involved in the observation of the free play period. The two main cameras were manned by a trained employee from the PREP room, and the author. The kindergarten teacher, a trained graduate student in early childhood education, manned the microphone for one camera and the author provided audio information for the camera which he was operating. The third camera was controlled by a PREP employee. This camera had a remote microphone which was located at the top of a large slide (see Diagram location 1), and the sole purpose for this camera was to record any interactions that occurred in the slide area, as this portion of the room was not clearly accessible to the other two cameras due to a slight obstruction.

Each of the main camera persons were equipped with a class list and they videotaped each child in the order of that list. The order was rotated each day, and each camera started at a different point in the order so that at no time were the two cameras videotaping the same individuals but rather were always approximately six individuals apart. The audio information consisted of pertinent information on the child being observed,

PREP Room

Diagram 1



■ - support pillar

▨ - climbing apparatus

⊣ ⊢ - door

1 & 2 - main cameras (on platform)

3 - slide area camera (in office)

a - steps and platform to trampoline

b - trampoline

c - climbing rope (*suspended from ceiling)

d - large mat (4m x 15m)

e - scooter ramp

f - play house

g - washrooms

h - observation room (one way glass windows)

i - large slide (2m ladder, 3m platform, 3m long slide)

and any overheard conversation between the child and another child was repeated onto the tape. The observations generally lasted 10 seconds in length, but if the nature of the activity was in question, or the nature of an interaction was in question, the camera person usually stayed with that activity a little longer. The extended observations occurred when it was difficult to decide, for example, whether or not children were wrestling in good fun or fighting. In no case did any observation exceed 25 seconds, and indeed over 95% of the observations were of ten seconds' duration. If a child was in the slide area and was not completely visible through the lens of the camera, then the footage was recorded and the observation was taken from the third camera which had a clear view of that area of the room. All machines were started simultaneously so as to ensure that footage readings would be identical on all three machines at any one point in time.

The free play sessions lasted 30 minutes and a maximum of 15 observations of each child were made.

VTR Analysis

Videotape observers made the decision as to which category of play was involved, on the basis of the 10 second interval of behavior observed on the tape. If the nature of the interaction was not perfectly clear, they then used audio information and extra tape information, where it was available, but only as it related to the 10 second interval and not involving some new behavior. A third source of information on two occasions was from the children. On one particular day children were walking holding chairs behind them in the same general area, but it was

not clear if they were actually with each other. The author was informed, by one of the children following the class, that they were robots from a spaceship that had landed on the moon and that their gyrating motions and lack of conversation was due to their role playing.

If two categories of play were observed in the same 10 second interval, then the one evident at the five second mark was recorded. All information was put on the recording sheets (see Appendix C) and if the interaction was in categories 5 through 10, a recording was also made as to who the children were playing with. In all the hours of videotape taken during the study, only two observations were thrown out, and then only because of poor camera work. In one instance there was not a clear view of the child, and in the other the sample interval was not of ten seconds duration.

Observer Accuracy Measures

For the purposes of observer accuracy measure, a member of the PREP staff was trained by a sample tape in the use of the play interaction instrument. The results of these measures are presented in Appendix B. It may be noted here that for all phases of the experiment they were high (overall mean 95.6%).

The PREP employee used was "blind" in that she had no notion as to the true purpose of the research (to be outlined in Chapter IV). She was simply instructed that the videotapes were 10 second intervals of children playing and that their play was to be classified, on the basis of the guidelines outlined in the preceding section, into one of the ten categories. The observer was trained from several tapes made for that purpose

and in the initial training session freely discussed the definitions, and any problem areas, with the experimenter. Once the experimenter was confident the observer clearly understood each category, both parties independently rated fifteen 10 second intervals. The tape was then rewound and results were compared and discussed.

It should be noted that a high level of agreement was evident from the outset and that this entire training session lasted approximately 45 minutes.

During the second training session, which lasted 50 minutes, the above procedure was repeated two or three times until it was felt by the experimenter that the PREP observer clearly understood what was involved, and a high level of agreement was evident between her ratings and those of the experimenter. At this point each observer independently reviewed a series of one hundred taped 10 second observations of children playing. Each observer independently rated the behavior observed in each of the 10 second intervals. The results were then compared. Over 90% agreement was recorded during the first session, but a second one hundred observations were rated to ensure it was not a chance occurrence. The interrater agreement for the second one hundred 10 second intervals was equally as high (over 90%), therefore training was terminated and the experiment began.

During the experiment, which will be detailed in the following chapter, tape recordings from two days during each of the four phases of the experiment were selected to be utilized for inter observer accuracy measures. The results of these measures are located in

Appendix B. Twenty disagreements in 453 observations were recorded. Only seven of the twenty involved a disagreement as to type (e.g. cooperative vs. individualistic) of play behavior, and four of these were disagreements between category 4 (Parallel Play) and category 5 (Associative Play). Prior to the experiment, it was felt that this would be the most difficult distinction to make and this proved to be the case.

Most of the disagreements did not involve a change of type of play. The most frequent was between category 3 (Independent Play) and category 4 (Parallel Play), both individualistic in nature.

All of the twenty disagreements are recorded in Appendix B, along with inter observer accuracy measures for each of the ten categories during each phase of the experiment.

The low frequency of observations in some categories make the scores virtually meaningless, but measures ranged from 83.3 to 100%. It should be noted that of the forty measures made (10 categories, 4 phases), only three (83.3%, 88.8%, 88.8%) fall below 90%. All results are recorded in Appendix B.

CHAPTER IV

THE COOPERATIVE GAMES - FREE PLAY EXPERIMENT

METHODS AND PROCEDURES

Introduction

This study involved two very distinct sections. During the first, an instrument for examining the interactions between children in a free play setting was developed. The second portion of the research used this instrument to ascertain as to whether or not a cooperative games program had any influence on the type and extent of social interaction between the children in a free play setting.

The subjects for the study were thirteen 3, 4 and 5 year old children enrolled at the University of Alberta, Elementary Education Kindergarten. Following a three week baseline videotape measurement of their free play interactions, the children were given 12 classes in cooperative games daily, immediately prior to their free play period. During this experimental phase of the program, the videotaping of interactions between the children in the free play setting was continued. Following the experimental phase, the children were again returned to the baseline condition of no cooperative games. Videotape records were continued on their interactions during the free play setting. This phase of the project lasted a week and a half. During the final week of the study, the experimental cooperative games were re-instituted followed by a videotape of free play sessions.

The videotape sessions were all done in the PREP room, an extensively equipped playroom containing climbing apparatus, slide, numerous toys, trampoline, etc. The children were taped with 3 VTR units. Two of

the units took 10 second samples of the children, individually rotating through the class list for a total of 15 observations of each child during each play period. The play periods lasted 30 minutes.

The third VTR unit, which had a remote microphone, was set up to capture behavior of the slide area. This portion of the room was not easily videotaped from the platform on which the other two cameras were located. If, while doing 10 second samples, the camera person was unable to locate the child, or saw the child moving towards the slide area, he/she merely recorded the footage that his/her VTR unit indicated, and that sample was taken from the videotape recording from the third machine. The videotape recordings were viewed by the researcher and a record was made of the type of play engaged in for each 10 second observation for each child. Samples of the sheets used for this procedure are located in Appendix A.

Observer accuracy measures were taken during all four phases of the project (Appendix B).

The results from these record sheets were then tabulated to examine whether or not the cooperative games program had any effect on the nature of the interactions between the children in a free play setting.

Sample

The children who served as subjects for the study were

thirteen students enrolled in the University of Alberta Department of Elementary Education Kindergarten. Detailed information on each child is given in Table I. A more detailed description of each child will be given in the results and discussion found in Chapter IV.

The subjects were thus a non-randomly selected, naturally occurring, ongoing group of children. The level of income and education of the parents was well above the national mean.

A general layman's description of the children might indicate that they were a reasonably healthy, happy, well-behaved group who seemed to enjoy themselves in the school program and in the free play environment.

Time and Duration of the Study

The study commenced on April 6, 1978 and concluded on May 25, 1978.

Experimental Settings

The cooperative games program was held in the dance gym at the University of Alberta, for the period April 24 to April 28, 1978 and thereafter was held in the wrestling gym. The latter was a smaller room (12m x 15m), with a completely padded floor which made the crawling activities in some of the games easier for the children.

The free play periods were held in the PREP room, which is a well equipped play room normally used to teach play skills to mentally-

Table 1

INFORMATION ON SUBJECTS

Subject	Sex	Birthdate	Age as of May 1/78	Siblings	Mother's Occupations	Father's Occupation
1	F	11/6/72	5 yrs. 11 mon.	Sister (7)	Homemaker	Plumber
2	F	24/2/74	4 yrs. 3 mon.	Brother (2)	Homemaker	Ph.D. student
3	M	3/9/73	4 yrs. 8 mon.	Sister (18 mon.)	Teacher - Homemaker	Student - Truck driver
4	F	5/9/72	5 yrs. 8 mon.	Brother (7) Brother (10)	Student - Nursery School Teacher	Ph.D. Student
5	M	22/7/74	3 yrs. 10 mon.	Brother (1)	Drama	Theatre producer
6	M	20/6/73	4 yrs. 11 mon.	Sister (20 mon.)	Librarian - Homemaker	Psychologist
7	F	2/5/73	5 yrs. --	Brother (7) Sister (3½)	Homemaker - Swim coach	Ph.D. student - University coach
8	M	25/9/73	4 yrs. 8 mon.	Brother (8)	Teacher	Instructor (Technology Inst.)
9	F	12/10/72	5 yrs. 7 mon.	Brother (7)	Resources teacher	University professor
10	M	11/6/73	4 yrs. 11 mon.	Sister (7)	Artist - Homemaker	Architect
11	M	15/4/73	5 yrs. 1 mon.	None	Student - Homemaker	Computer Programer
12	F	25/3/73	5 yrs. 2 mon.	Sister (7) Brother (2) Brother (3 mon.)	Homemaker	University professor
13	M	25/7/72	5 yrs. 10 mon.	Sister (8)	Music teacher - Homemaker	University Professor

AVERAGE AGE: 5 yrs. (as of 1/5/78)

RANGE: 3 yrs. 10 mon. to 5 yrs. 10 mon.

retarded children. The PREP room is in the Education Building, located across the street from the Physical Education Building, which houses the gymnasia in which the cooperative games were taught. Travel time between the two buildings, for the children, was approximately 5 minutes. A description of the PREP room and the equipment contained therein is given in Appendix D. Locations of cameras and major pieces of equipment are shown in Diagram 1.

The gymnasiums were new to most of the children, but they had all had many previous play experiences in the PREP room. Scheduled free play sessions had been held there at least once a week since the beginning of the school year in September, 1977.

Experimental Design

An ABAB design was used. Information on each phase is presented in Table 2. There were several reasons for using this particular design. It possesses all the advantages usually attributed to a single subject design in that it:

(1) Yields a principle of behavior applicable to a particular individual which is sometimes found to be equally applicable to a number of individuals upon replication, and is, therefore, said to constitute a general principle.

(2) Minimizes individual subject differences as comparisons are made between an individual's behavior under one condition and under another condition. (Sulzer - Azoroff and Mayer, 1977, p. 445).

In addition, the ABAB design is a reversal design which has as its major advantage "that it demonstrates a functional relation between the dependent behavior and the intervention". (Sulzer - Azoroff and Mayer, 1977, p. 450). One added advantage is that it can also serve as a teaching tool to demonstrate - in this case to the physical education teacher - just how effective the program is.

There were several additional reasons for using this particular design in this study. The relatively low number of subjects (N = 13) did not allow for a control group without raising many problems with intervening variables. It was also felt that the simplicity of the design lent itself well to provide an example to the practitioner of a simple, clear procedure for looking at change in physical education settings without drastic modifications to class schedules and curricula.

Information on each phase is presented in Table 2, below:

Table 2

	A	B	A	B
School Days	Apr. 6-7, 10-14; 17-21	Apr. 24-28, May 1, 2, 5-9	May 10-12, 15-19	May 22-25
Testing Days	Apr. 6, 11, 13, 18, 20	Apr. 25, 27, May 2, 4, 9	May 11, 16, 18	May 23, 25
Phase	Baseline	1st Treatment	Baseline	2nd Treatment
Number of Game Days	0	12	0	3

Analysis of the free play was done every Tuesday and Thursday morning throughout the 8 week period in which the study was conducted. The free play sessions, which were held in the PREP room, ran from 9:30 to 10:00 a.m. During the experimental or treatment phase, the games program was given every morning from 9:30 until 10:00, and on Tuesdays and Thursdays was followed by a short break in order to move to the Education Building and time for juice and cookies before the 30 minute free play period from 10:30 was conducted.

Experimental or Treatment Condition - Independent Variable

The independent variable is defined in the section at the conclusion of this chapter as "The Games Program". The series of cooperative games developed by Terry Orlick (1977) which were used in this program are presented in detail in Appendix A. The game classes were of 30 minutes' duration and were conducted by the author.

The development of the games program was discussed in the last section of the Review of Literature. The behaviors that are encouraged by the games are those found in the definitions of categories 5 to 8 of the play interaction instrument. The main behaviors and the dependent variables are touching, coordinating actions with others to complete a task, playing together in harmony, sharing of materials and the taking of turns. But it is clear that when the independent variable is defined quite simply as the cooperative games program, an expansion as to what is meant by "program" is essential. The program referred to here includes not only the games themselves, but the entire environment within which

they were played. The games provided the structure around which the teacher operated, and as such, a close look at the rules of the games indicates clues as to the behaviors that were to be encouraged.
It is generally accepted that resulting behavior in any situation is a function of the interaction between what the child brings to the situation and the environment itself. It is most difficult to accurately label all the components of the cooperative games play environment. Each child may select out different stimuli within that environment on the basis of what he brings to it. The best that can be done here is to describe the environment from the teacher's perspective, outlining what types of behaviors were encouraged or reinforced and how or what form this reinforcement took.

The teacher, in this case the author, rewarded appropriate responses with praise and a demonstration by the children of particularly good responses. The teacher made every effort to avoid reinforcing inappropriate responses by ignoring those responses and paying particular attention to the good responses. During the teaching of "fish gobler" (see Appendix A), for example, the teacher stood in close proximity to the children who were hanging on to each other and encouraged those children in contact with other children to raise their hands together and yell 'rescue' as loudly as they wished at the end of each segment of the game. Children who were not involved in the group were for the most part ignored. One child who was particularly aggressive when making contact with the others was encouraged to "swim" (crawling on the floor) in making contact.

This behavior was then passed on to all the children and the child who was originally exhibiting inappropriate behavior was reinforced by praise and attention when he performed the appropriate response.

In games such as "frozen bean-bag," the children were rewarded for assisting the other children, and not for how long they managed to balance the bean-bag. Every attempt was made throughout the game playing sessions to encourage and reinforce behaviors that are outlined in the definitions of categories 5 to 8 of the play interaction instrument. In games such as bean-bag balance, children were rewarded not so much for novel ways of carrying the bean-bags between the various parts of their bodies, but for how well they coordinated to perform the task. Examples of comments made by the teacher would include "Now that's cooperation, John! You and Sam are really moving together well." "Good, Sally! That was nice of you to help David."

On several occasions the teacher presented a new game to the children through one of the Sesame Street characters, in this instance Grover. It was apparent from the outset that the children were very fond of Grover, and he was used frequently to explain the rules, and issue out the praise and rewards. No actual puppet figure was used, but the author merely imitated Grover's voice.

In summary, it might be said that the teacher used all the principles of good teaching behavior to instill cooperation in the children that one might use to teach any skill. A very definite attempt was made to link the reward - in most cases a pat on the back, a positive comment, or attention - to a specific cooperative behavior.

It will be noted from the day to day report in Appendix A that certain games were played more frequently than others. This is because the children were free to choose one or two games a class, and they invariably chose "non-elimination hot potato", or "fish gobbler".

Data Analysis

The analysis of results will be presented for the group as a whole as well as for each individual. It is realized that certain liberties are being taken in presenting group results from an experiment using a single subject design. It was felt, however, that the group could be treated as a single unit, should the group mean and the median be of relatively the same magnitude. This proved to be the case for all phases of the experiment. Demographic information from a teacher, plus graph results of changes in the frequency of categories through 5 - 8 throughout 4 phases of the experiment, will be presented for each child and for the group along with a discussion of those results. A percentage breakdown of each child's observations over the 10 categories will be presented and discussed. A similar procedure will be used for the results of the group as a whole. A final table for each individual will provide information on the average number of cooperative play interactions he/she had with each of his/her classmates during the play period in each of the four phases of the experiment. This information will provide an indication of the extensity (the number of other children involved) as well as the intensity (and with what frequency) of cooperative interactions.

There will be no statistical analysis of the results to determine the significance. This author will consider results to have "practical significance" should these vary by 10% from treatment to treatment, or between categories within the same phase. The results are presented in such a manner that the reader may himself decide on the significance of the finding.

Limitations

It is necessary to acknowledge the following possible limitations on this study:

(1) This study could have been limited to a small degree in that no first-hand audio recording was possible except on the slide area camera.

(2) This study was very slightly limited in that supporting pillars in the free play room presented minor interference with some of the videotaping.

Delimitations

It is necessary to acknowledge the following delimitations on this study:

(1) The study was delimited to an 8-week time period, April 6 to May 25, 1978.

(2) The study was delimited to a sample of thirteen Canadian children between the ages of 3 yrs. 10 months and 5 yrs. 10 months attending the morning classes at the Department of Elementary Education Kindergarten at the University of Alberta at Edmonton, Alberta, Canada.

(3) The study was delimited in that the analysis of the free play was done with three VTR units and behaviors were recorded in ten pre-determined categories based on 10-second observation intervals.

Definition of Terms

The definition for each category of the instrument to analyze play is found in the first section of Chapter III.

Independent Variable in this study is the games program.

Dependent Variable is cooperation as measured in categories 5 to 8 of the interaction instrument.

Games Program is a series of cooperative games given in physical education class to the subjects. These games are outlined in Appendix A.

Subjects were 13 children attending the kindergarten program conducted by the Department of Elementary Education, University of Alberta, March 1, to May 24, 1978.

PREP Room is a playroom in which free play periods were held. A detailed description of equipment and dimensions is given in Appendix D.

Free Play occurs when the child directs his own play, deciding which toys he will play with and how. He is influenced only by his peers, the play environment, and the teacher (when safety or another child's welfare becomes a factor). The teacher is present in the room but tries to remain uninvolved. When he/she is approached, an attempt is made to break the contact as soon as possible without directing the child's activity.

CHAPTER V

THE COOPERATIVE GAMES - FREE PLAY EXPERIMENT

RESULTS AND DISCUSSION

Introduction

The first set of results to be presented and discussed in this chapter are those of the group as a whole. The group information is presented in advance of individual results to facilitate comparisons between each subject's results and trends established by the group.

The second portion of this chapter will present results and discussion for each individual subject. Background information, provided by the two teachers, will precede the discussion of each subject's results. The background information is taken from a tape recorded interview with one of the teachers. It is, for the most part, a transcript of those tapes and has only been edited slightly.

The teacher, who holds an M.A. in early childhood education, was asked to provide a little background information on the child that might be helpful in interpreting free play (pre experiment) behavior. It is not presented as a complete portrait of each subject and his/her socialization to date. The material is presented in order to provide the reader with some background information which might assist in explaining the behaviors exhibited by that particular child. It is presented with the hope that, when coupled with the results of the analysis of each child's play, a reasonably clear picture and more informative analysis will emerge.

Group Results

The results for the group are presented in Tables 3 and 4, and in Figure 1 and 2. Table 3 is a summary of the number of observations of each type of play recorded during each of the four phases of the experiment. This information was then collapsed into three main categories of play (Solo, Cooperative and Competitive) from the ten basic categories. This, and the percentage of time spent in each during the four phases of the experiment, is presented in Table 4.

Figure 1 graphically presents the percentage of time subjects were observed in each type of cooperative play for the four phases of the experiment. Also presented in Figure 1 are bar graphs depicting the mean and median for the group cooperative score (categories 5-8).

The main focus of this research, as outlined in the statement of the problem in the first chapter, was to determine the effects of cooperative games participation on the nature of social interaction among the subjects. The collapsed categories in Figure 1 and 2 are used to indicate changes in the cooperative category of play which is of particular interest to this study. Figure 2 presents the collapsed data for cooperative play behavior of the group for each testing day during the four phases of the experiment.

Discussion of Group Results

It seems clear from the information presented in Table 4, and Figure 1 and 2, that the games program had a strong effect on the amount of total overall cooperative play observed in the free play setting. The baseline group mean of 13.2% indicates, as Barnes (1971) pointed out,

TABLE 3

GROUP INFORMATION

Time Observed in Each Category of Play

Types of Play Categories	Baseline	1st Treatment	Baseline	2nd Treatment
1. Solo - Unoccupied Behavior	2.6% (23)	.5% (4)	1.2% (6)	0% (0)
2. Solo - Onlooker	11.7% (101)	9.8% (85)	14.4% (74)	8.2% (29)
3. Solo - Independent Play	48.3% (418)	27.3% (236)	29.5% (151)	19.5% (69)
4. Parallel Activity	14.8% (128)	7.5% (65)	10.7% (55)	4.8% (17)
5. Associative Play	6.3% (55)	28.9% (250)	14.6% (75)	18.4% (65)
6. Co-operative Assisting Behavior	1.6% (14)	1.6% (14)	1.4% (7)	1.7% (6)
7. Co-operative Physical Contact Behavior	1.3% (11)	.6% (5)	.2% (1)	0% (0)
8. Co-operative Task Co-ordination	4.0% (35)	16.1% (139)	11.7% (60)	32.9% (116)
9. Negative Social Interaction	6.0% (52)	2.9% (25)	6.8% (35)	7.1% (25)
10. Competitive Play Behavior	3.3% (29)	5.0% (43)	9.4% (48)	7.4% (26)
Number of Observations	(866)	(866)	(512)	(353)

N = number of observations

% = percentage of total observations for that phase

TABLE 4

PERCENTAGE OF TIME IN EACH MAJOR TYPE OF PLAY

FOR ENTIRE SAMPLE (N = 13)

Major Play Categories	Baseline	1st Treatment	Baseline	2nd Treatment
Solo (Categories 1 - 4)	77.4% (670)	45.1% (390)	55.8% (286)	32.5% (115)
Co-operative (Categories 5 - 8)	13.2% (115)	47.1% (408)	27.9% (143)	53.0% (187)
Competitive (Categories 9 and 10)	9.3% (81)	7.9% (68)	16.2% (83)	14.5% (51)
Number of Observations	(866)	(866)	(512)	(353)

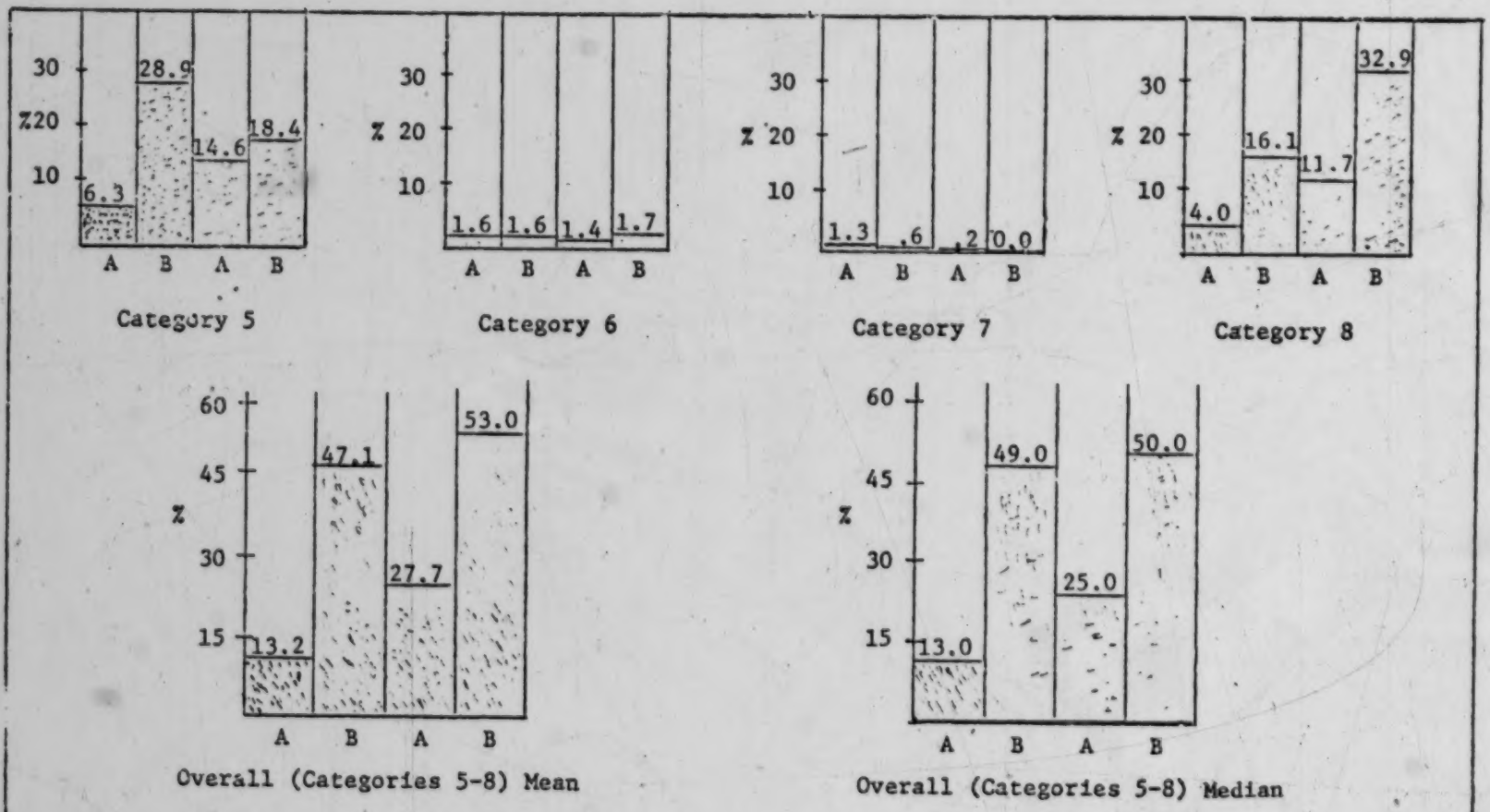
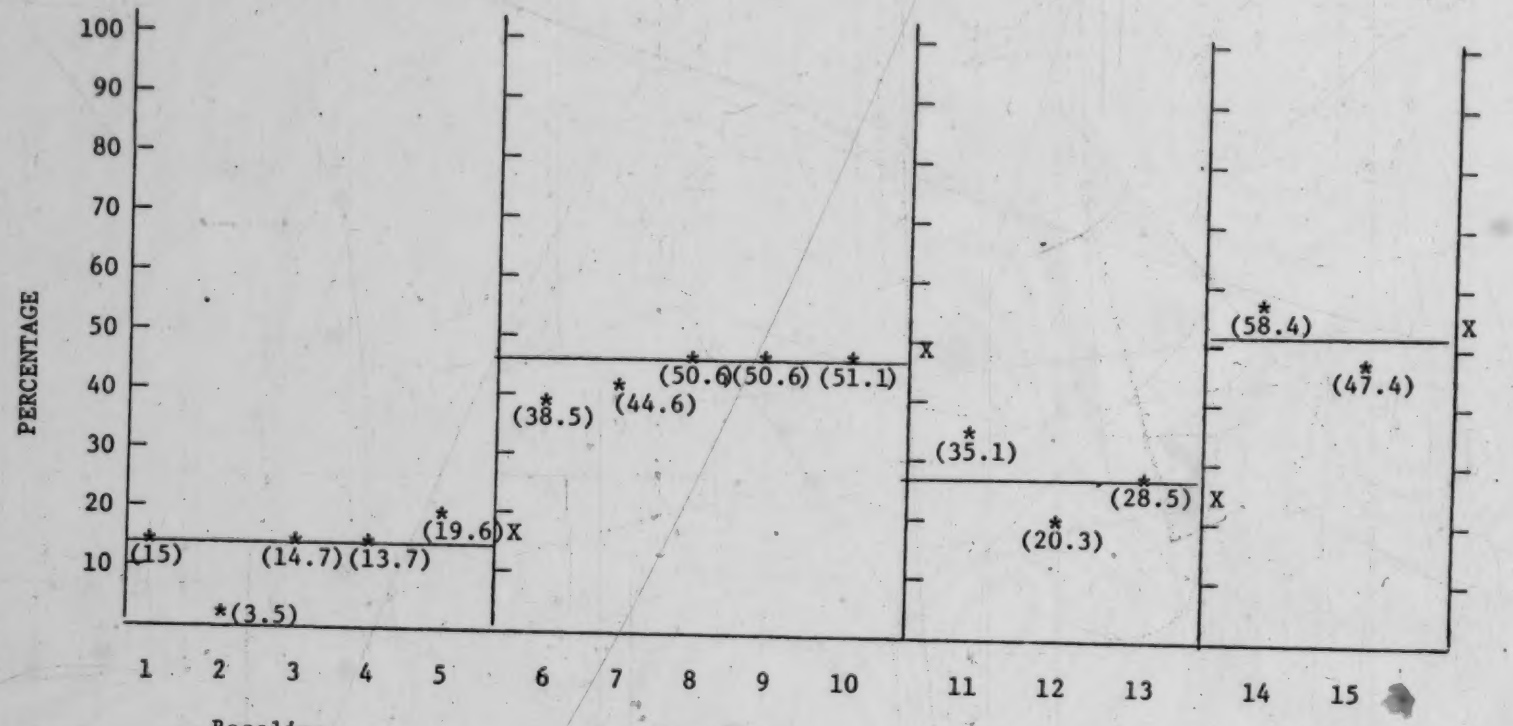


FIGURE 1

Percentage of Time Observed in Cooperative Play



Range = 3.5-19.6%
Mean = 13.2%
Median = 13%

Range = 38.5-51.1%
Mean = 47.1%
Median = 49%

Range = 20.3-35.1%
Mean = 27.7%
Median = 25%

Range = 47.4-58.4%
Mean = 53.0%
Median = 50%

FIGURE 2 - GROUP INFORMATION

Percentage of Time Observed in Cooperative Play (Categories 5-8)

that cooperative play is at a relatively low level when compared with solo or independent play (77.4%)

Figure 2 indicated that the percentage of time observed in cooperative play increases dramatically during the first treatment period to a magnitude of 51.1% on the last day, with an overall mean of 47.1% for the five test days during the first treatment phase.

The exact nature of the effect the games program had on the children is not clear at this point. However, the sudden drop to a group mean of 27.7% during the reinstated baseline condition suggests that the games are indeed the influence. The review of literature stressed that cooperation was a learned response (Azrin & Lindsley, 1956; Cohen, 1962; and Cohen and Lindsley, 1964), and the subsequent rise to a new high of 53.0% (group mean) during the short three day second treatment phase clearly indicates an improved performance establishing a connection between the games and the increased cooperation between the children.

Several other facts support this contention. Prior to the second baseline phase, it could have been argued that rehearsal was the only factor influencing the quality of free play, but the fact that a fairly high level of cooperation was retained and the rise to even higher levels during the second treatment suggests a pattern similar to that followed in most performance improvement situations where a condition is introduced, removed and re-introduced again.

An examination of the four bar graphs at the top of Figure 1, however, indicates that the increase in cooperative play performance was primarily due to category 5, associative play, during the first treatment

phase, and category 8 during the second treatment phase. Categories 6 and 7 did not contribute at all to the increase in overall cooperative play. There appear to be several possible explanations for this finding. First it can be argued that cooperative assisting behaviors are of a higher order in the hierarchy of cooperative behavior than either of the other categories. Behavior of this type is primarily intrinsically motivated and thus requires some type of internalization of the concept of cooperation.

A second possible explanation, which would also help explain the low level of behaviors in category 6, is that the games did not emphasize category 6 type play behaviors. Only one of the games played contained a clear assistive orientation (Frozen Bean-Bag). None of the games were specifically directed at physical contact behavior (category 7) without some task coordination being involved.

An analysis of the games very quickly yields the conclusion that they are almost entirely geared towards category 8, cooperative task coordination, and to a somewhat lesser extent, category 5, associative play. The most plausible conclusion, therefore, is that the cooperative play behaviors exhibited by the children closely resembled those reinforced within the games setting. There was no apparent transfer to other forms of cooperative play that were not so directly and heavily reinforced. There is no way to establish if time was a limiting factor. Perhaps if the game playing had continued, a transfer to higher order cooperative behavior would have been more evident.

Table 3 gives a more detailed analysis for all ten types of play. There are several points of interest.

There was a reduction in behaviors observed in solo categories 1 and 2 (unoccupied and onlooker) during both treatment phases. During the first treatment phase the major portion of the increase in play may be accounted for by the increase in associative play (category 5), whereas during the second treatment phase a more advanced form of cooperative play, that of task coordination (category 8), accounts for 32.9 of the group mean of 53% cooperative play.

As discussed above, assistive or helping behaviors (category 6) are constant throughout the experiment, and appear to be unaffected by the games program. The same may be said of cooperative physical contact behavior (category 7).

It was expected that the games program would have a side effect of reducing negative social interaction. This was true for the first treatment phase where the number was cut to 25, less than half the 52 observed during the same number of observations (866) during the baseline measures. During the second baseline, however, the percentage was up to 6.8%, slightly above the 6% first baseline measure, and climbed even higher (7.1%) during the second treatment phase. There were 25 negative social interactions during this second treatment phase. An examination of individual results suggests some possible explanations for this apparent overall rise of 4.2% over the first treatment phase.

Of the 25 negative interactions observed, 23 may be accounted for by 4 of the subjects. Subject (10) had 10, in the two test days;

Subject (4) had 5 in the only day she was present during that phase, and Subjects (6) and (13) had 8 between them. There are several possible causes for this observation. Subject (4) was classified as a hyperactive child, and also the teacher noted on rainy days that all the children went "berserk indoors" and on the last test day it was raining heavily.

There appears to be an inability for subject (10) to deal with the increased social contact during the treatment phase. This will be discussed when the individual results are presented in the second section of this chapter. It is sufficient to note here that this subject accounts for 40% of the negative social interaction.

Subjects (6) and (12) account for most of the increase in the competitive play behaviors (category 10) during the experiment, and on eight occasions during the final phase the competitive play behaviors observed shifted in nature to become negative social interaction (category 9). (category 9). The majority of the eight interactions resulted from what started out as fun competitive wrestling or chasing activities, but changed when one of the children was overly aggressive or rough. Subject (10) was involved in most of these instances.

Table 4 presents group means for the three major types of play. It is interesting to note that there is an increase in competitive play behavior in the last two phases of the experiment, lending support for Mead's (1941) contention that the two concepts (competitive and co-operative) are not incompatible opposites but are to some degree related. A rise in cooperative behaviors does not ensure a subsequent drop in observed competitive behaviors.

In summary, the results clearly point out that the cooperative games program increased cooperation, as measured by categories 5 - 8 in free play periods. The fact that the group median (figure 1) are within 3% of the group mean indicates that this increase is not due to a drastic increase on the part of a few subjects but is due to a general increase in cooperative play for most of the sample in the play setting. The results for individual subjects will be more closely examined in the section that follows.

Individual Results

The results for each subject are displayed in the Tables 5-30 and Figures 3-15. There are 3 sets of results for each individual. The results, for each subject, are presented together to provide easy access and reference to the information for any one individual.

The first figure outlines in graphic form the percentage of observations during which that individual was observed in cooperative play (categories 5 - 8) for each free play period. The table that follows each graph displays the average number of cooperative interactions, per free play period, a subject had with his twelve classmates during each of the four phases of the experiment. It should be noted that this information is provided to help determine the extensity (number of different playmates) as well as the intensity (strength) of cooperation. Because the table uses averages which are sometimes comprised of relatively few observations over a few days, no conclusion will be drawn from this chart alone without reference to other information. It is provided to help shed light on the more substantial information found in the first figure, and to a lesser extent, the second table.

The second table in each set is a detailed analysis of the time the subject spent in each of the ten categories of play for each of the four phases of the experiment.

Following the 26 tables and 13 figures (3 per subject) the background information on each subject, provided by the teachers, will be presented. The discussion of the results, in light of this information, will then be presented.

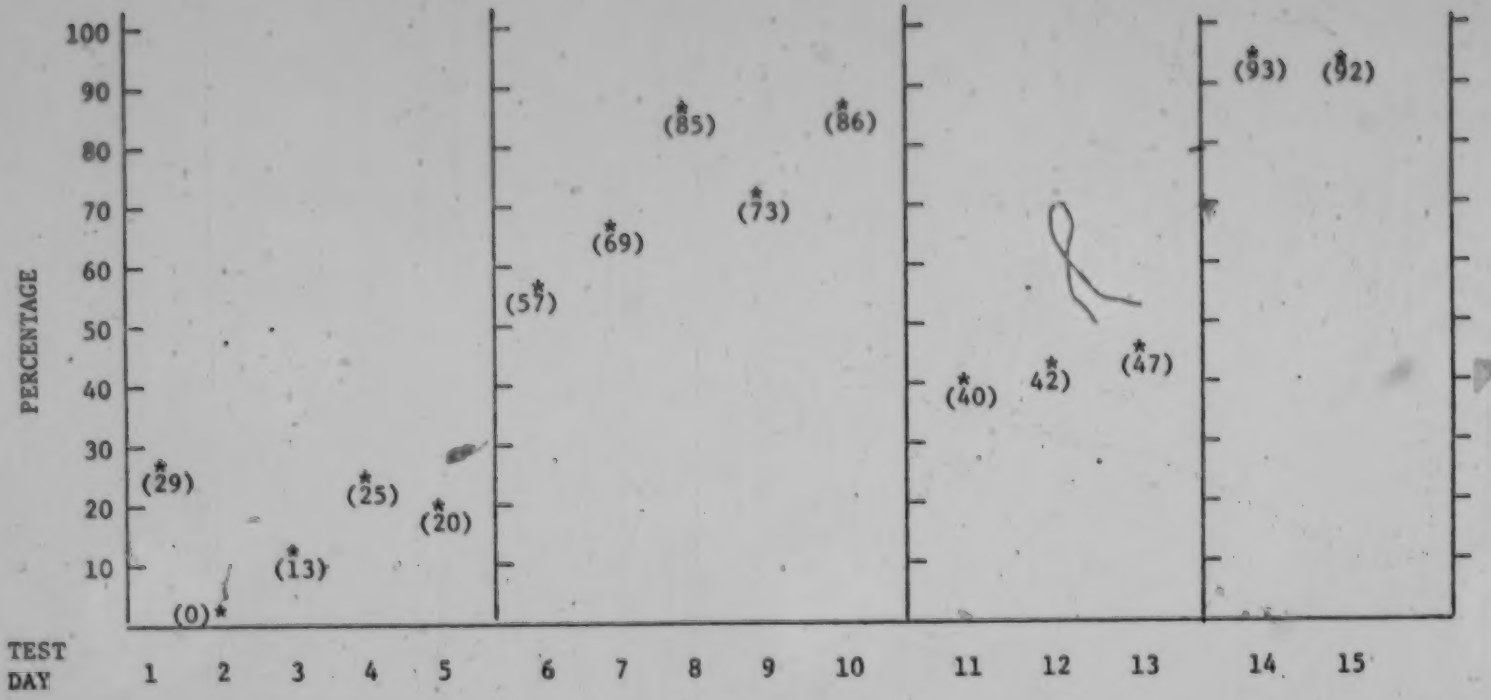


FIGURE 3 - SUBJECT (1)

Percentage of Time Observed in Cooperative Play (Categories 5-8)

TABLE 5

SUBJECT (1)

AVERAGE NUMBER OF COOPERATIVE INTERACTIONS

PER PLAY PERIOD WITH EACH CLASSMATE

Phases of Experiment

Subjects	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	Days Present
Baseline	/ /				1.2		.4	.2	.8					N = 5
1st Treatment	/ /	3.6		1.0	1.2		3.4	1.8	4.0		.2			N = 5
Baseline	/ /	.3			1.3		.6	1.0	4.3		1.0	.3		N = 3
2nd Treatment	/ /	1.0			2.5		7.5		13.0		1.5	1.0		N = 2

$$\text{Score for each phase} = \frac{\text{Total cooperative interactions (Categories 5-8) for that phase}}{\text{Number of days present during that phase}}$$

TABLE 6

SUBJECT (1)

Time Observed in Each Category of Play

Types of Play Categories	Baseline	1st Treatment	Baseline	2nd Treatment
1. Solo - Unoccupied Behavior	6% (4)	0% (0)	0% (0)	0% (0)
2. Solo - Onlooker	17% (12)	6% (4)	10% (4)	0% (0)
3. Solo - Independant Play	43% (30)	17% (11)	38% (16)	7% (2)
4. Parallel Activity	11% (8)	4% (3)	10% (4)	0% (0)
5. Associative Play	6% (4)	44% (29)	33% (14)	36% (10)
6. Co-operative Assisting Behavior	3% (2)	1% (1)	0% (0)	0% (0)
7. Co-operative Physical Contact Behavior	4% (3)	3% (2)	2% (1)	0% (0)
8. Co-operative Task Co-ordination	4% (3)	24% (16)	7% (3)	57% (16)
9. Negative Social Interaction	3% (2)	0% (0)	0% (0)	0% (0)
10. Competitive Play Behavior	3% (2)	0% (0)	0% (0)	0% (0)
Number of Observations	(70)	(66)	(42)	(28)

N = number of observations

% = percentage of total observations for that phase

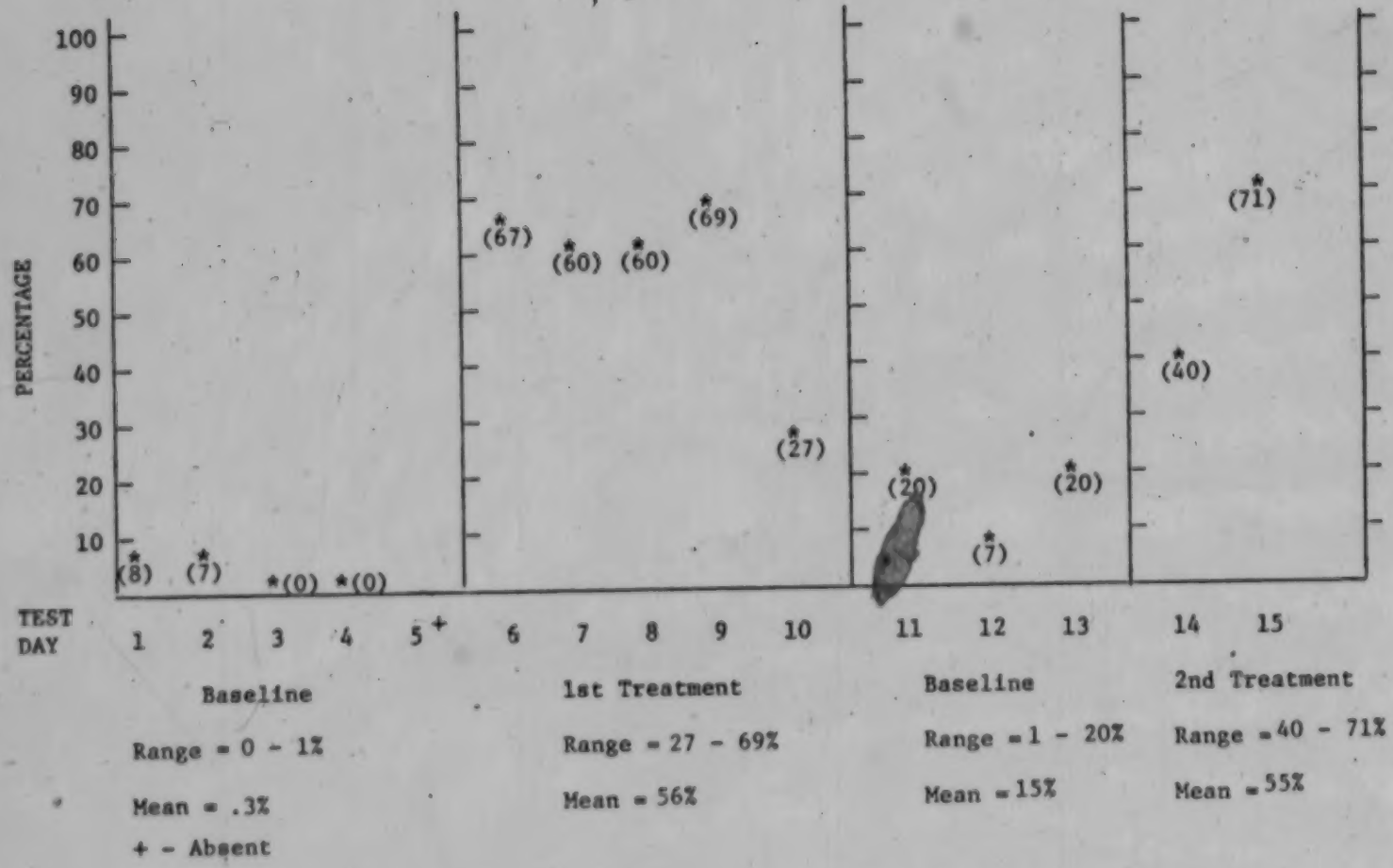


FIGURE 4 - SUBJECT (2)

Percentage of Time Observed in Cooperative Play (Categories 5-8)

TABLE 7

SUBJECT (2)

AVERAGE NUMBER OF COOPERATIVE INTERACTIONS

PER PLAY PERIOD WITH EACH CLASSMATE

Phases of Experiment

Subjects	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	Days Present
Baseline		//					.25	.25						N = 4
1st Treatment	4.0	//		.6	1.2	.2	3.1	.8	2.1			.2		N = 5
Baseline	1.3	//					.7	.7	1.7	.3		1.7	.7	N = 3
2nd Treatment	2.5	//			2.0		1.5	.5	2.0		.5	7.0		N = 2

$$\text{Score for each phase} = \frac{\text{Total cooperative interactions (Categories 5-8) for that phase}}{\text{Number of days present during that phase}}$$

TABLE 8

SUBJECT (2)

Time Observed in Each Category of Play

Types of Play Categories	Baseline	1st Treatment	Baseline	2nd Treatment
1. Solo - Unoccupied Behavior	0% (0)	0% (0)	4% (2)	0% (0)
2. Solo - Onlooker	5% (3)	14% (10)	16% (7)	10% (3)
3. Solo - Independent Play	76% (44)	27% (20)	53% (24)	28% (8)
4. Parallel Activity	16% (9)	3% (2)	11% (5)	7% (2)
5. Associative Play	0% (0)	27% (20)	7% (3)	34% (10)
6. Co-operative Assisting Behavior	0% (0)	1% (1)	2% (1)	7% (2)
7. Co-operative Physical Contact Behavior	2% (1)	0% (0)	0% (0)	0% (0)
8. Co-operative Task Co-ordination	2% (1)	27% (20)	7% (3)	14% (4)
9. Negative Social Interaction	0% (0)	0% (0)	0% (0)	0% (0)
10. Competitive Play Behavior	0% (0)	0% (0)	0% (0)	0% (0)
Number of Observations	(58)	(73)	(45)	(29)

N = number of observations

% = percentage of total observations for that phase

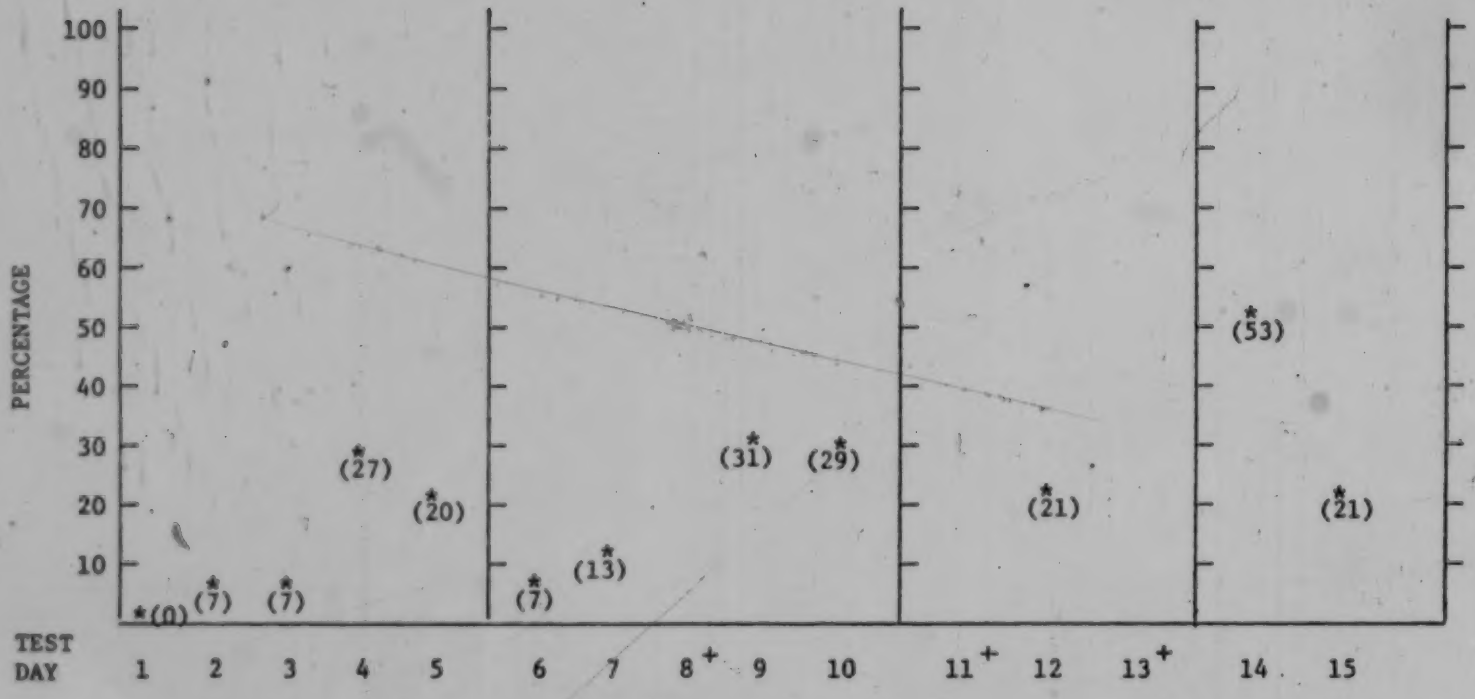


FIGURE 5 - SUBJECT (3)

Percentage of Time Observed in Cooperative Play (Categories 5-8)

TABLE 9

SUBJECT (3)

AVERAGE NUMBER OF COOPERATIVE INTERACTIONS

PER PLAY PERIOD WITH EACH CLASSMATE

Phases of Experiment

Subjects	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	Days Present
Baseline			/ /							1.0	.6		.6	N = 5
1st Treatment			/ /					.25		1.0	1.0	.25	.25	N = 4
Baseline			/ /					3.0						N = 1
2nd Treatment			/ /					2.5		.5	4.5		.5	N = 2

$$\text{Score for each phase} = \frac{\text{Total cooperative interactions (Categories 5-8) for that phase}}{\text{Number of days present during that phase}}$$

TABLE 10

SUBJECT (3)

Time Observed in Each Category of Play

Types of Play Categories	Baseline	1st Treatment	Baseline	2nd Treatment
1. Solo - Unoccupied Behavior	1% (1)	2% (1)	0% (0)	0% (0)
2. Solo - Onlooker	18% (13)	12% (7)	7% (1)	17% (5)
3. Solo - Independent Play	44% (31)	42% (24)	50% (7)	41% (12)
4. Parallel Activity	21% (15)	12% (7)	14% (2)	0% (0)
5. Associative Play	8% (6)	11% (6)	21% (3)	17% (5)
6. Co-operative Assisting Behavior	0% (0)	2% (1)	0% (0)	10% (3)
7. Co-operative Physical Contact Behavior	0% (0)	0% (0)	0% (0)	0% (0)
8. Co-operative Task Co-ordination	4% (3)	7% (4)	0% (0)	10% (3)
9. Negative Social Interaction	3% (2)	5% (3)	0% (0)	0% (0)
10. Competitive Play Behavior	0% (0)	7% (4)	7% (1)	3% (1)
Number of Observations	(71)	(57)	(14)	(29)

N = number of observations

% = percentage of total observations for that phase

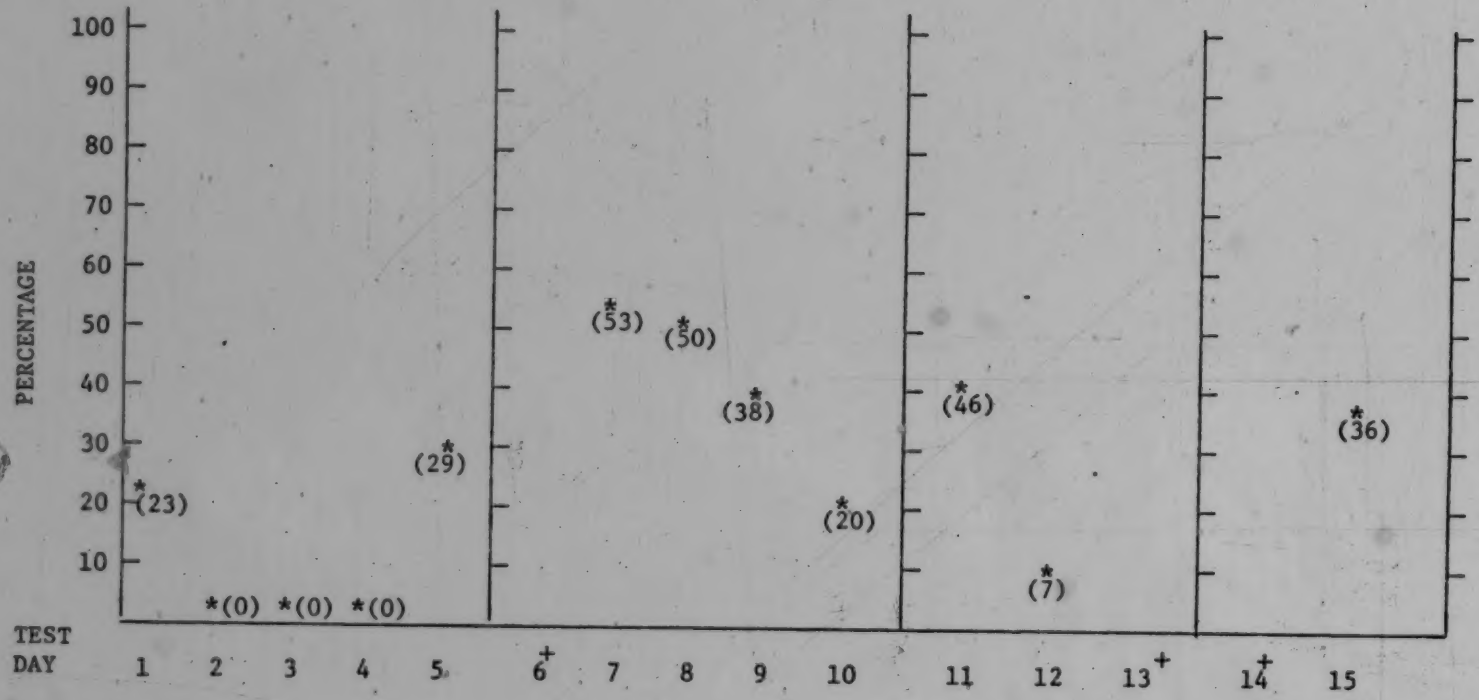


FIGURE 6 - SUBJECT (4)

Percentage of Time Observed in Cooperative Play (Categories 5-8)

TABLE 11

SUBJECT (4)

AVERAGE NUMBER OF COOPERATIVE INTERACTIONS

PER PLAY PERIOD WITH EACH CLASSMATE

Phases of Experiment

Subjects	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	Days Present
Baseline			.2	//				.2		.8	.2	.2	.2	N = 5
1st Treatment	.5	.25	.25	//		1.5	.5	1.5	.5	.75	2.75	1.25	2.0	N = 4
Baseline		.5		//		3.5		.5			3.0		.5	N = 2
2nd Treatment				//	1.0	3.0		2.0			2.0	1.0		N = 1

$$\text{Score for each phase} = \frac{\text{Total cooperative interactions (Categories 5-8) for that phase}}{\text{Number of days present during that phase}}$$

TABLE 12

SUBJECT (4)

Time Observed in Each Category of Play

Types of Play Categories	Baseline	1st Treatment	Baseline	2nd Treatment
1. Solo - Unoccupied Behavior	1% (1)	0% (0)	0% (0)	0% (0)
2. Solo - Onlooker	11% (8)	7% (4)	10% (3)	0% (0)
3. Solo - Independent Play	57% (40)	29% (17)	17% (5)	14% (2)
4. Parallel Activity	11% (8)	5% (3)	10% (3)	0% (0)
5. Associative Play	6% (4)	31% (18)	3% (1)	7% (1)
6. Co-operative Assisting Behavior	3% (2)	3% (2)	3% (1)	0% (0)
7. Co-operative Physical Contact Behavior	0% (0)	0% (0)	0% (0)	0% (0)
8. Co-operative Task Co-ordination	1% (1)	5% (3)	17% (5)	29% (4)
9. Negative Social Interaction	4% (3)	14% (8)	30% (9)	36% (5)
10. Competitive Play Behavior	4% (3)	5% (3)	10% (3)	14% (2)
Number of Observations	(70)	(58)	(30)	(14)

N = number of observations

% = percentage of total observations for that phase

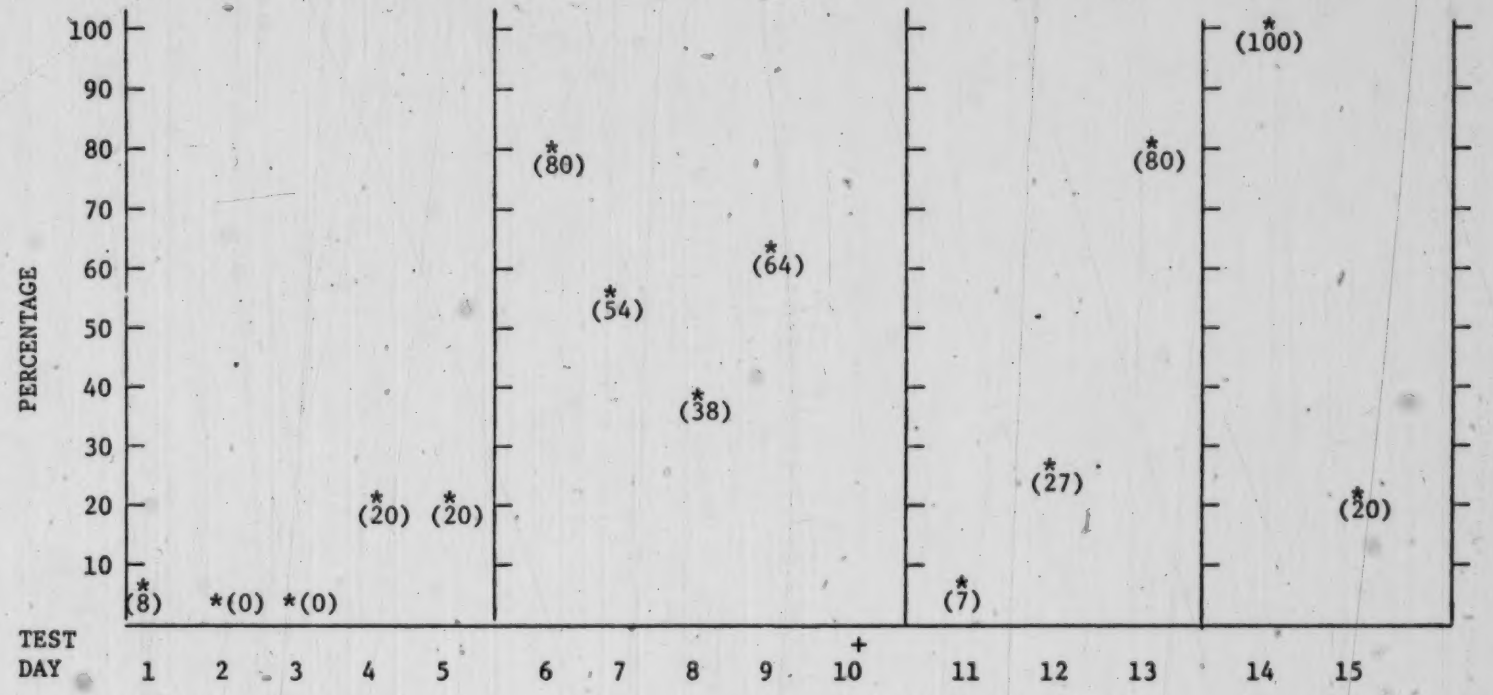


FIGURE 7 - SUBJECT (5)

Percentage of Time Observed in Cooperative Play (Categories 5-8)

TABLE 13

SUBJECT (5)

AVERAGE NUMBER OF COOPERATIVE INTERACTIONS

PER PLAY PERIOD WITH EACH CLASSMATE

Phases of Experiment

Subjects	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	Days Present
Baseline	.4				/ /				.8					N = 5
1st Treatment	2.75	2.25			/ /		2.5	1.0	6.5		.25			N = 4
Baseline	1.7				/ /		1.3		5.0					N = 3
2nd Treatment	6.0	1.5		.5	/ /		5.0	.5	5.5		1.0	1.0		N = 2

$$\text{Score for each phase} = \frac{\text{Total cooperative interactions (Categories 5-8) for that phase}}{\text{Number of days present during that phase}}$$

TABLE 14

SUBJECT (5)

Time Observed in Each Category of Play

Types of Play Categories	Baseline	1st Treatment	Baseline	2nd Treatment
1. Solo - Unoccupied Behavior	8% (5)	0% (0)	2% (1)	0% (0)
2. Solo - Onlooker	19% (12)	18% (10)	18% (8)	0% (0)
3. Solo - Independent Play	42% (27)	16% (9)	31% (14)	28% (7)
4. Parallel Activity	20% (13)	5% (3)	7% (3)	4% (1)
5. Associative Play	0% (0)	42% (23)	27% (12)	20% (5)
6. Co-operative Assisting Behavior	0% (0)	0% (0)	0% (0)	0% (0)
7. Co-operative Physical Contact Behavior	8% (5)	0% (0)	0% (0)	0% (0)
8. Co-operative Task Co-ordination	2% (1)	18% (10)	13% (6)	48% (12)
9. Negative Social Interaction	2% (1)	0% (0)	2% (1)	0% (0)
10. Competitive Play Behavior	0% (0)	0% (0)	0% (0)	0% (0)
Number of Observations	(64)	(55)	(45)	(25)

N = number of observations

% = percentage of total observations for that phase

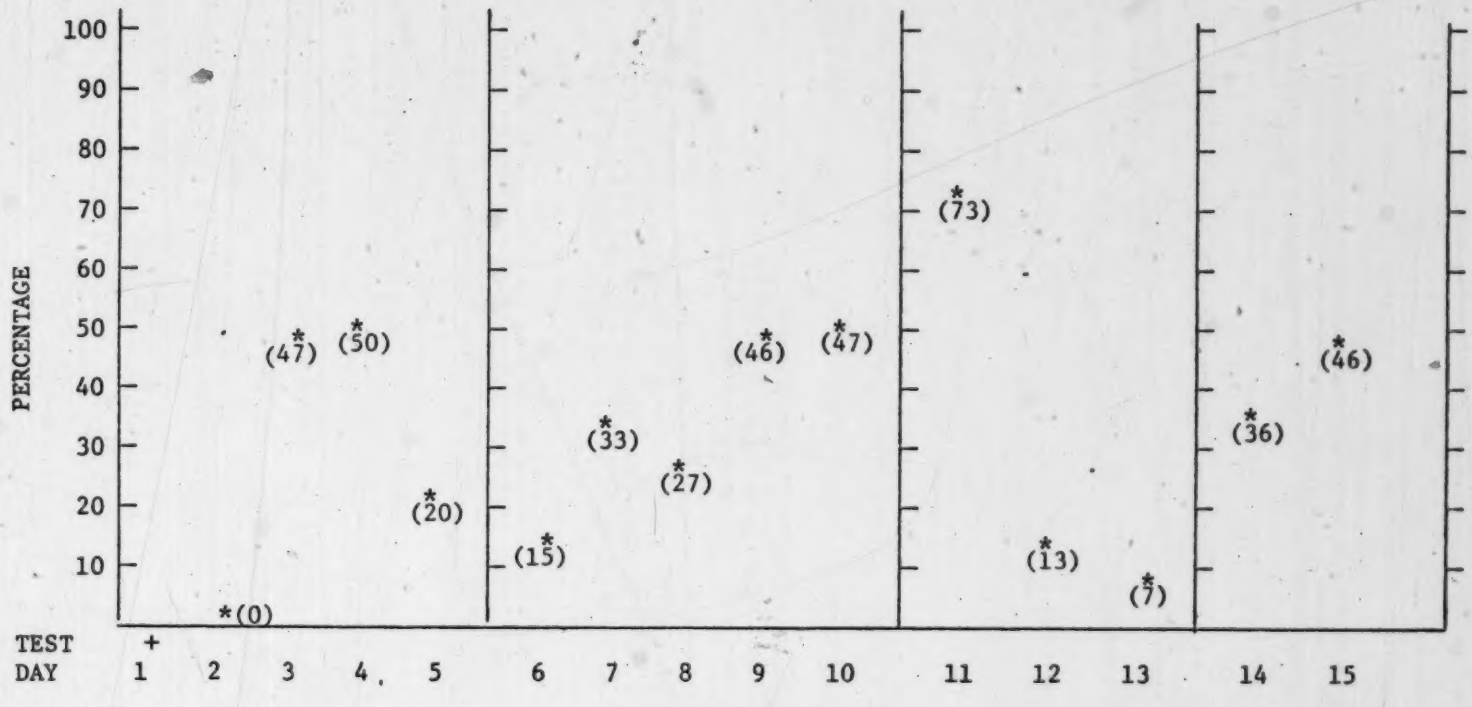


FIGURE 8 - SUBJECT (6)

Percentage of Time Observed in Cooperative Play (Categories 5-8)

TABLE 15

SUBJECT (6)

AVERAGE NUMBER OF COOPERATIVE INTERACTIONS

PER PLAY PERIOD WITH EACH CLASSMATE

Phases of Experiment

Subjects	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	Days Present
Baseline						//			.25		1.5		3.0	N = 4
1st Treatment				.8		//		3.2		.4	1.4	1.0	3.8	N = 5
Baseline		.3		1.7		//		1.0			2.3		2.3	N = 3
2nd Treatment				1.5		//		1.0		.5	1.5		3.0	N = 2

$$\text{Score for each phase} = \frac{\text{Total cooperative interactions (Categories 5-8) for that phase}}{\text{Number of days present during that phase}}$$

TABLE 16

SUBJECT (6)

Time Observed in Each Category of Play

Types of Play Categories	Baseline	1st Treatment	Baseline	2nd Treatment
1. Solo - Unoccupied Behavior	2% (1)	1% (1)	2% (1)	0% (0)
2. Solo - Onlooker	7% (4)	14% (10)	7% (3)	4% (1)
3. Solo - Independent Play	37% (21)	21% (15)	18% (8)	19% (5)
4. Parallel Activity	16% (9)	14% (10)	2% (1)	4% (1)
5. Associative Play	12% (7)	14% (10)	9% (4)	19% (5)
6. Co-operative Assisting Behavior	2% (1)	1% (1)	2% (1)	0% (0)
7. Co-operative Physical Contact Behavior	0% (0)	0% (0)	0% (0)	0% (0)
8. Co-operative Task Co-ordination	16% (9)	18% (13)	20% (9)	22% (6)
9. Negative Social Interaction	5% (3)	1% (1)	7% (3)	11% (3)
10. Competitive Play Behavior	4% (2)	14% (10)	33% (15)	22% (6)
Number of Observations	(57)	(71)	(45)	(27)

N = number of observations

% = percentage of total observations for that phase

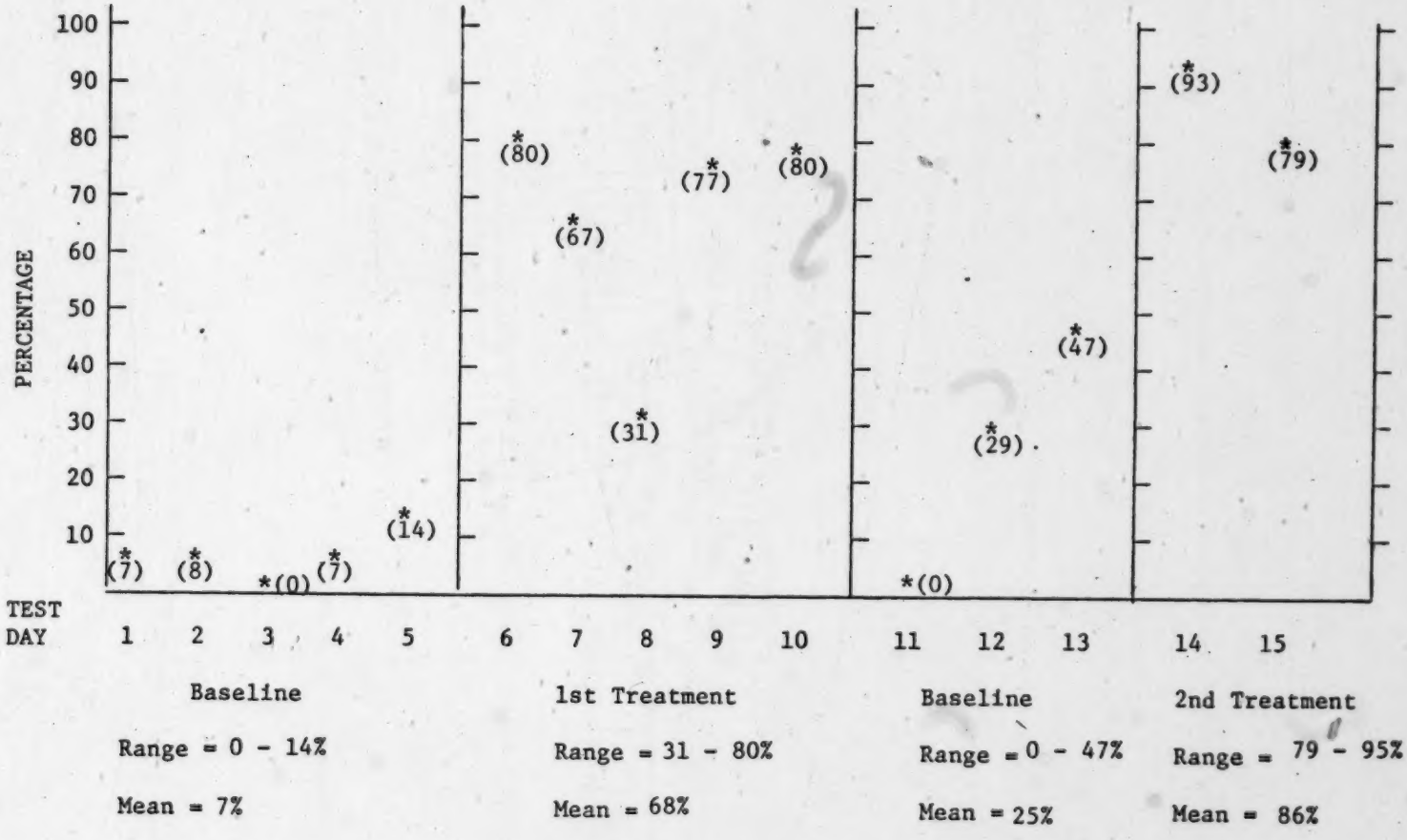


FIGURE 9 - SUBJECT (7)

Percentage of Time Observed in Cooperative Play (Categories 5-8)

TABLE 17

SUBJECT (7)

AVERAGE NUMBER OF COOPERATIVE INTERACTIONS

PER PLAY PERIOD WITH EACH CLASSMATE

Phases of Experiment

Subjects	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	Days Present
Baseline	.2		.2	.4		.2	//			.2				N = 5
1st Treatment	4.0	4.2		1.0	2.6		//	1.2	5.3		.6			N = 5
Baseline	.7				1.3		//	1.0	1.7	.7	.7			N = 3
2nd Treatment	10.5	2.5	.5		4.0		//	1.5	12.0		2.0	2.0		N = 2

$$\text{Score for each phase} = \frac{\text{Total cooperative interactions (Categories 5-8) for that phase}}{\text{Number of days present during that phase}}$$

TABLE 18

SUBJECT (7)

Time Observed in Each Category of Play

Types of Play Categories	Baseline	1st Treatment	Baseline	2nd Treatment
1. Solo - Unoccupied Behavior	8% (6)	0% (0)	2% (1)	0% (0)
2. Solo - Onlooker	17% (12)	6% (4)	16% (7)	10% (3)
3. Solo - Independent Play	55% (39)	23% (16)	41% (18)	3% (1)
4. Parallel Activity	6% (4)	3% (2)	2% (1)	0% (0)
5. Associative Play	0% (0)	39% (28)	11% (5)	17% (5)
6. Co-operative Assisting Behavior	3% (2)	3% (2)	0% (0)	0% (0)
7. Co-operative Physical Contact Behavior	1% (1)	0% (0)	0% (0)	0% (0)
8. Co-operative Task Co-ordination	3% (2)	25% (18)	14% (6)	69% (20)
9. Negative Social Interaction	6% (4)	0% (0)	9% (4)	0% (0)
10. Competitive Play Behavior	1% (1)	1% (1)	5% (2)	0% (0)
Number of Observations	(71)	(71)	(44)	(29)

N = number of observations

% = percentage of total observations for that phase

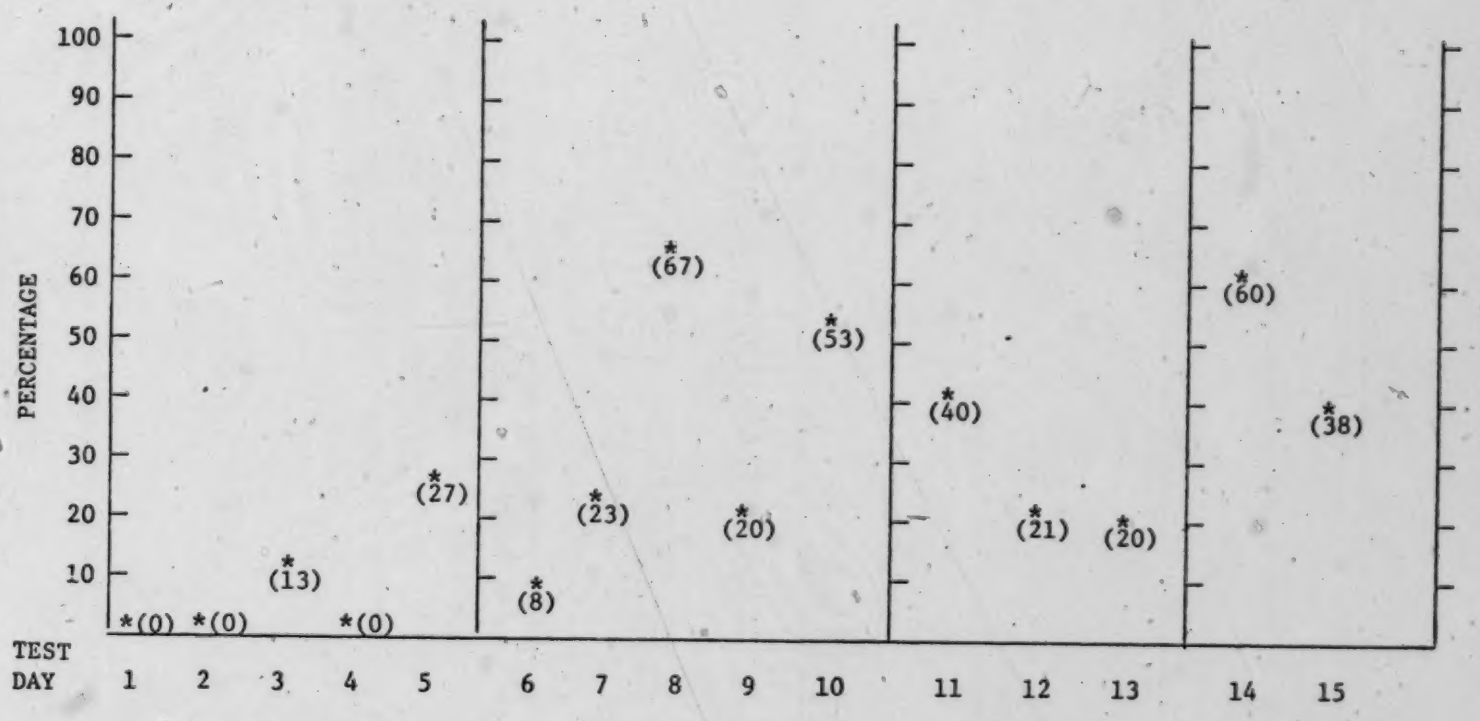


FIGURE 10 - SUBJECT (8)

Percentage of Time Observed in Cooperative Play (Categories 5-8)

TABLE 19

SUBJECT (8)

AVERAGE NUMBER OF COOPERATIVE INTERACTIONS

PER PLAY PERIOD WITH EACH CLASSMATE

Phases of Experiment

Subjects	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	Days Present
Baseline	.2		.4			.2		//		.4	.2	.2	.6	N = 5
1st Treatment	2.2	1.0	.4	2.0		.8	1.0	//	1.4		1.6	1.0	1.0	N = 5
Baseline	.3	.3		.3		.7	.7	//			1.3	.3	1.7	N = 3
2nd Treatment	1.0	.5	1.5	.5	1.0	1.0	1.0	//	1.0		7.0	.5		N = 2

$$\text{Score for each phase} = \frac{\text{Total cooperative interactions (Categories 5-8) for that phase}}{\text{Number of days present during that phase}}$$

TABLE 20

SUBJECT (8)

Time Observed in Each Category of Play

Types of Play Categories	Baseline	1st Treatment	Baseline	2nd Treatment
1. Solo - Unoccupied Behavior	3% (2)	0% (0)	0% (0)	0% (0)
2. Solo - Onlooker	9% (6)	11% (8)	23% (10)	7% (2)
3. Solo - Independent Play	51% (33)	37% (26)	14% (6)	32% (9)
4. Parallel Activity	15% (10)	15% (11)	20% (9)	11% (3)
5. Associative Play	5% (3)	24% (17)	16% (7)	21% (6)
6. Co-operative Assisting Behavior	3% (2)	3% (2)	2% (1)	0% (0)
7. Co-operative Physical Contact Behavior	0% (0)	0% (0)	0% (0)	0% (0)
8. Co-operative Task Co-ordination	0% (0)	8% (6)	9% (4)	29% (8)
9. Negative Social Interaction	12% (8)	0% (0)	9% (4)	0% (0)
10. Competitive Play Behavior	2% (1)	1% (1)	7% (3)	0% (0)
Number of Observations	(65)	(71)	(44)	(28)

N = number of observations

% = percentage of total observations for that phase

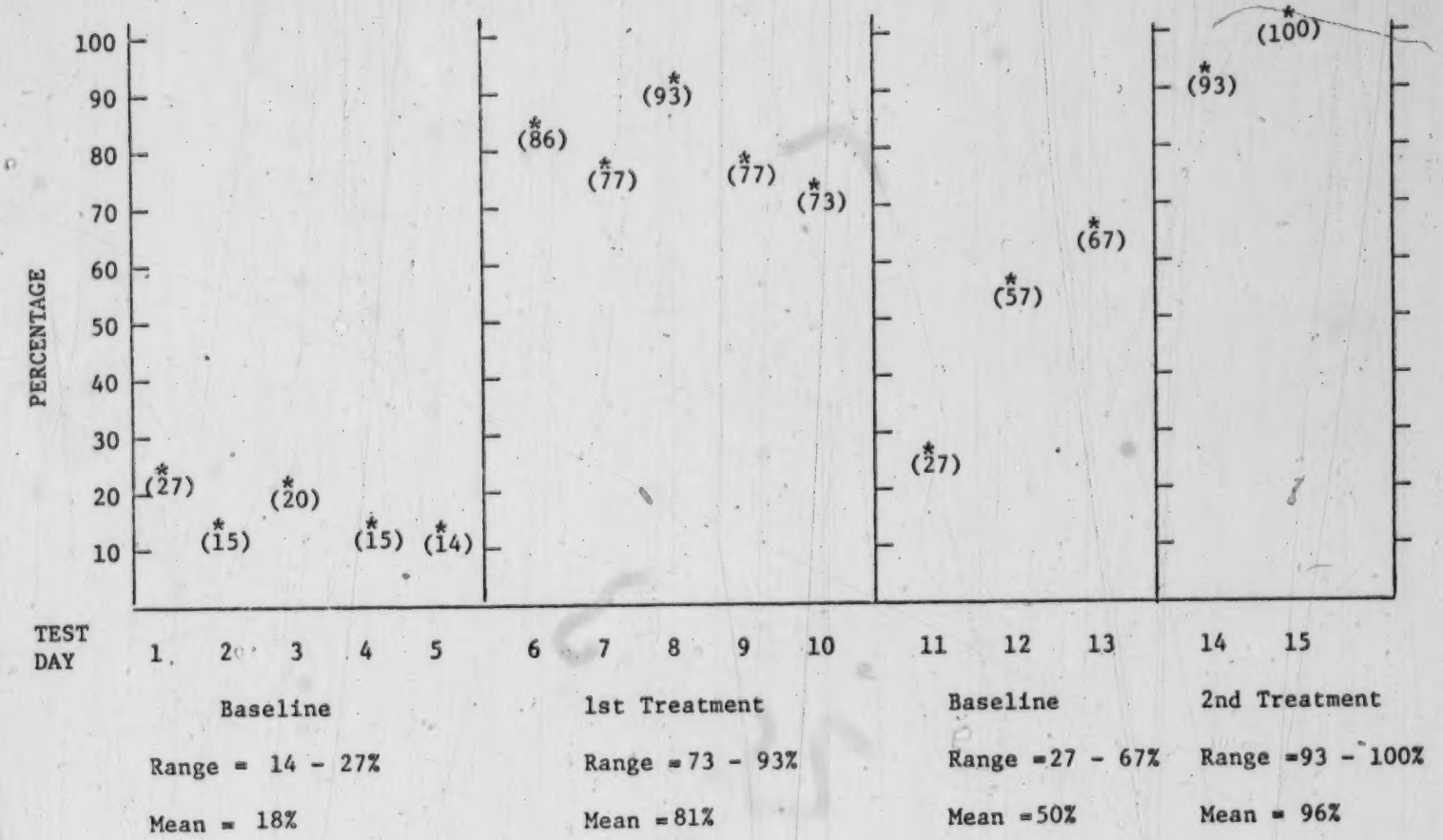


FIGURE 11 - SUBJECT (9)

Percentage of Time Observed in Cooperative Play (Categories 5-8)

TABLE 21

SUBJECT (9)

AVERAGE NUMBER OF COOPERATIVE INTERACTIONS

PER PLAY PERIOD WITH EACH CLASSMATE

Phases of Experiment

Subjects	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	Days Present
Baseline	1.4				.2	.2	.2	.2	//					N = 5
1st Treatment	6.4	3.8	.2	.4	4.6		5.0	1.2	//	.2	.6			N = 5
Baseline	3.7	.7			3.7		1.3		//		.3	.3		N = 3
2nd Treatment	12.5	1.5			4.0		11.0	1.0	//		1.5	1.5		N = 2

$$\text{Score for each phase} = \frac{\text{Total cooperative interactions (Categories 5-8) for that phase}}{\text{Number of days present during that phase}}$$

TABLE 22

SUBJECT (9)

Time Observed in Each Category of Play

Types of Play Categories	Baseline	1st Treatment	Baseline	2nd Treatment
1. Solo - Unoccupied Behavior	2% (1)	0% (0)	0% (0)	0% (0)
2. Solo - Onlooker	11% (7)	1% (1)	7% (3)	0% (0)
3. Solo - Independent Play	45% (30)	13% (9)	32% (14)	3% (1)
4. Parallel Activity	15% (10)	4% (3)	9% (4)	0% (0)
5. Associative Play	11% (7)	59% (41)	39% (17)	17% (5)
6. Co-operative Assisting Behavior	2% (1)	3% (0)	0% (0)	0% (0)
7. Co-operative Physical Contact Behavior	2% (1)	0% (2)	0% (0)	0% (0)
8. Co-operative Task Co-ordination	5% (3)	20% (14)	11% (5)	79% (23)
9. Negative Social Interaction	3% (2)	0% (0)	2% (1)	0% (0)
10. Competitive Play Behavior	6% (4)	0% (0)	0% (0)	0% (0)
Number of Observations	(66)	(70)	(44)	(29)

N = number of observations

% = percentage of total observations for that phase

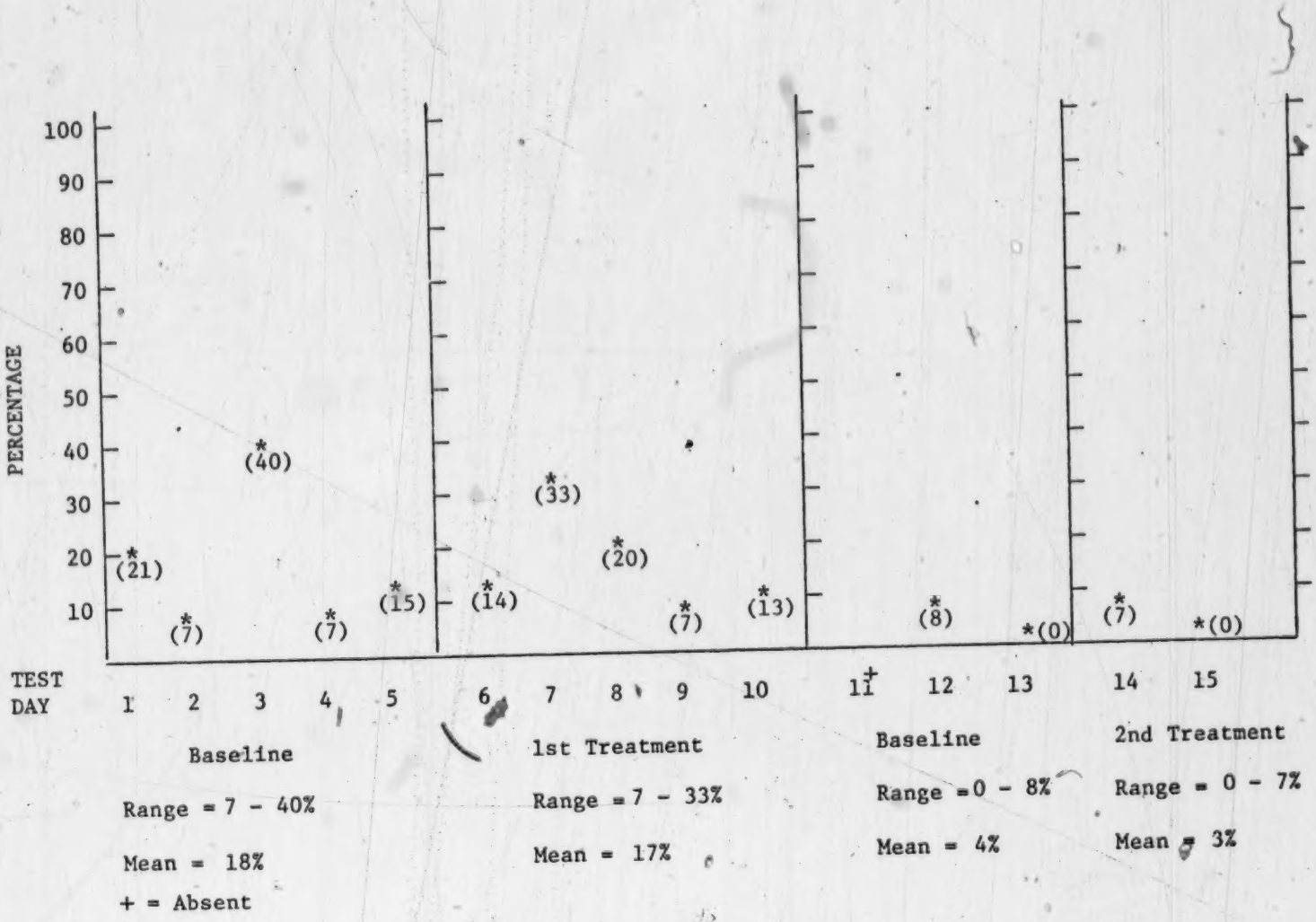


FIGURE 12 - SUBJECT (10)

Percentage of Time Observed in Cooperative Play (Categories 5-8)

TABLE 23

SUBJECT (10)

AVERAGE NUMBER OF COOPERATIVE INTERACTIONS

PER PLAY PERIOD WITH EACH CLASSMATE

Phases of Experiment	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	Days Present
Baseline			.2	.4			.2			/ /	.4		1.3	N = 5
1st Treatment	.4	.2	.6	.4		.4	.4	.2	.4	/ /	.2	.2	.8	N = 5
Baseline							.2			/ /				N = 2
2nd Treatment						.2				/ /			.2	N = 2

$$\text{Score for each phase} = \frac{\text{Total cooperative interactions (Categories 5-8) for that phase}}{\text{Number of days present during that phase}}$$

TABLE 24

SUBJECT (10)

Time Observed in Each Category of Play

Types of Play Categories	Baseline	1st Treatment	Baseline	2nd Treatment
1. Solo - Unoccupied Behavior	0% (0)	1% (1)	4% (1)	0% (0)
2. Solo - Onlooker	7% (5)	13% (9)	11% (3)	24% (7)
3. Solo - Independent Play	32% (23)	39% (27)	36% (10)	14% (4)
4. Parallel Activity	17% (12)	14% (10)	4% (1)	3% (1)
5. Associative Play	11% (8)	11% (8)	0% (0)	3% (1)
6. Co-operative Assisting Behavior	1% (1)	0% (0)	0% (0)	0% (0)
7. Co-operative Physical Contact Behavior	0% (0)	1% (1)	0% (0)	0% (0)
8. Co-operative Task Co-ordination	6% (4)	4% (3)	4% (1)	0% (0)
9. Negative Social Interaction	17% (12)	9% (6)	25% (7)	34% (10)
10. Competitive Play Behavior	8% (6)	7% (5)	18% (5)	21% (6)
Number of Observations	(71)	(70)	(28)	(29)

N = number of observations

% = percentage of total observations for that phase

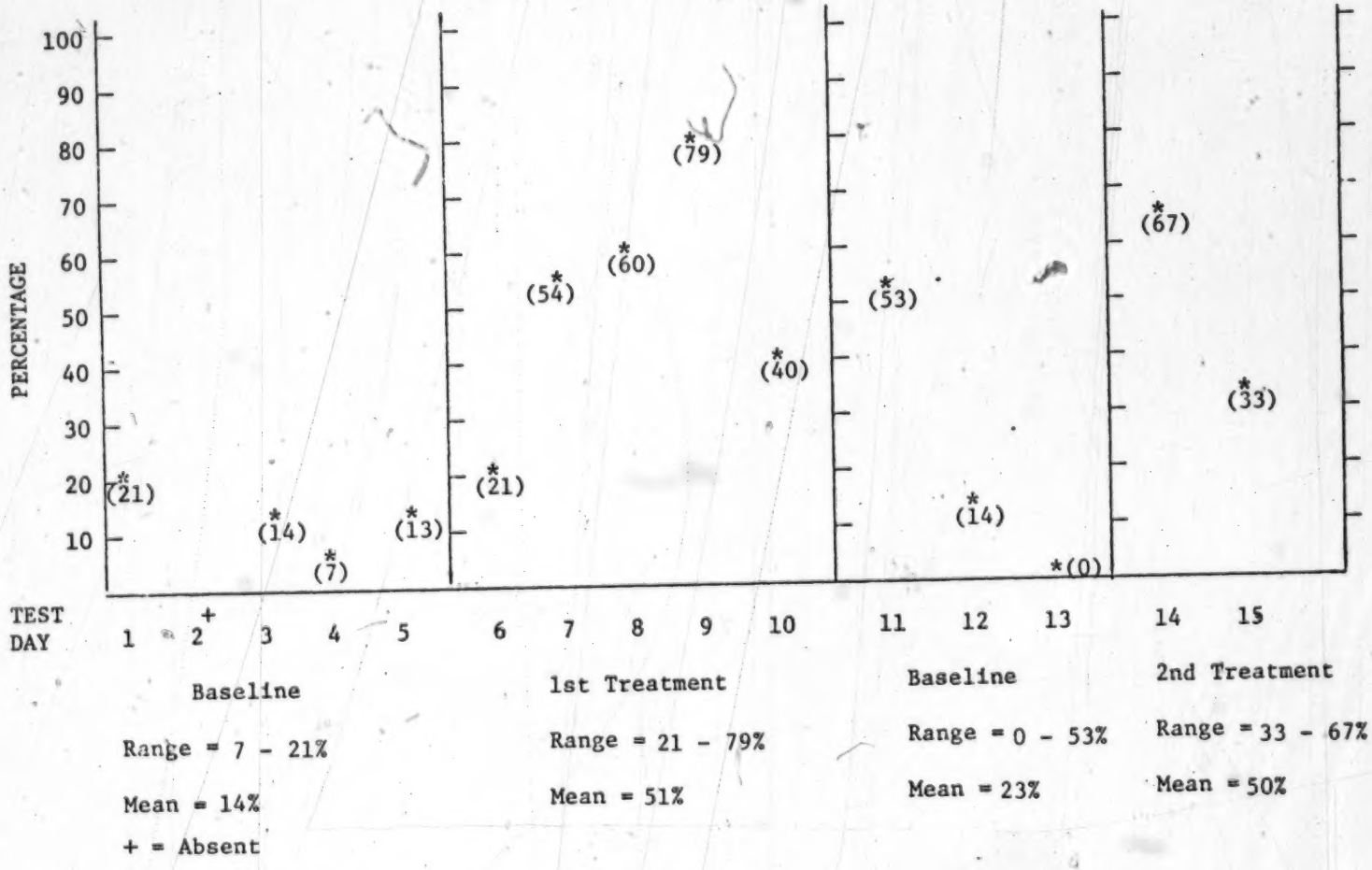


FIGURE 13 - SUBJECT (11)

Percentage of Time Observed in Cooperative Play (Categories 5-8)

TABLE 25

SUBJECT (11)

AVERAGE NUMBER OF COOPERATIVE INTERACTIONS

PER PLAY PERIOD WITH EACH CLASSMATE

Phases of Experiment

Subjects	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	Days Present
Baseline			.5	.5	.25	.75		.25			/ /	.25	.75	N = 4
1st Treatment	1.6	1.0	.6	1.6	.6	2.0	1.0	1.3	.8		/ /	.4	2.8	N = 5
Baseline				2.3		2.0					/ /			N = 3
2nd Treatment	2.5	.5	.5	1.5	2.5	1.5	1.5	4.8	2.0		/ /	.5		N = 2

$$\text{Score for each phase} = \frac{\text{Total cooperative interactions (Categories 5-8) for that phase}}{\text{Number of days present during that phase}}$$

TABLE 26

SUBJECT (11)

Time Observed in Each Category of Play

Types of Play Categories	Baseline	1st Treatment	Baseline	2nd Treatment
1. Solo - Unoccupied Behavior	0% (0)	1% (1)	0% (0)	0% (0)
2. Solo - Onlooker	12% (7)	7% (5)	16% (7)	3% (1)
3. Solo - Independent Play	46% (26)	25% (18)	27% (12)	27% (8)
4. Parallel Activity	19% (11)	6% (4)	23% (10)	10% (3)
5. Associative Play	9% (5)	34% (24)	9% (4)	10% (3)
6. Co-operative Assisting Behavior	4% (2)	3% (2)	2% (1)	0% (0)
7. Co-operative Physical Contact Behavior	0% (0)	0% (0)	0% (0)	0% (0)
8. Co-operative Task Co-ordination	2% (1)	14% (10)	11% (5)	40% (12)
9. Negative Social Interaction	9% (5)	8% (6)	5% (2)	7% (2)
10. Competitive Play Behavior	0% (0)	1% (1)	7% (3)	3% (1)
Number of Observations	(57)	(71)	(44)	(30)

N = number of observations

% = percentage of total observations for that phase

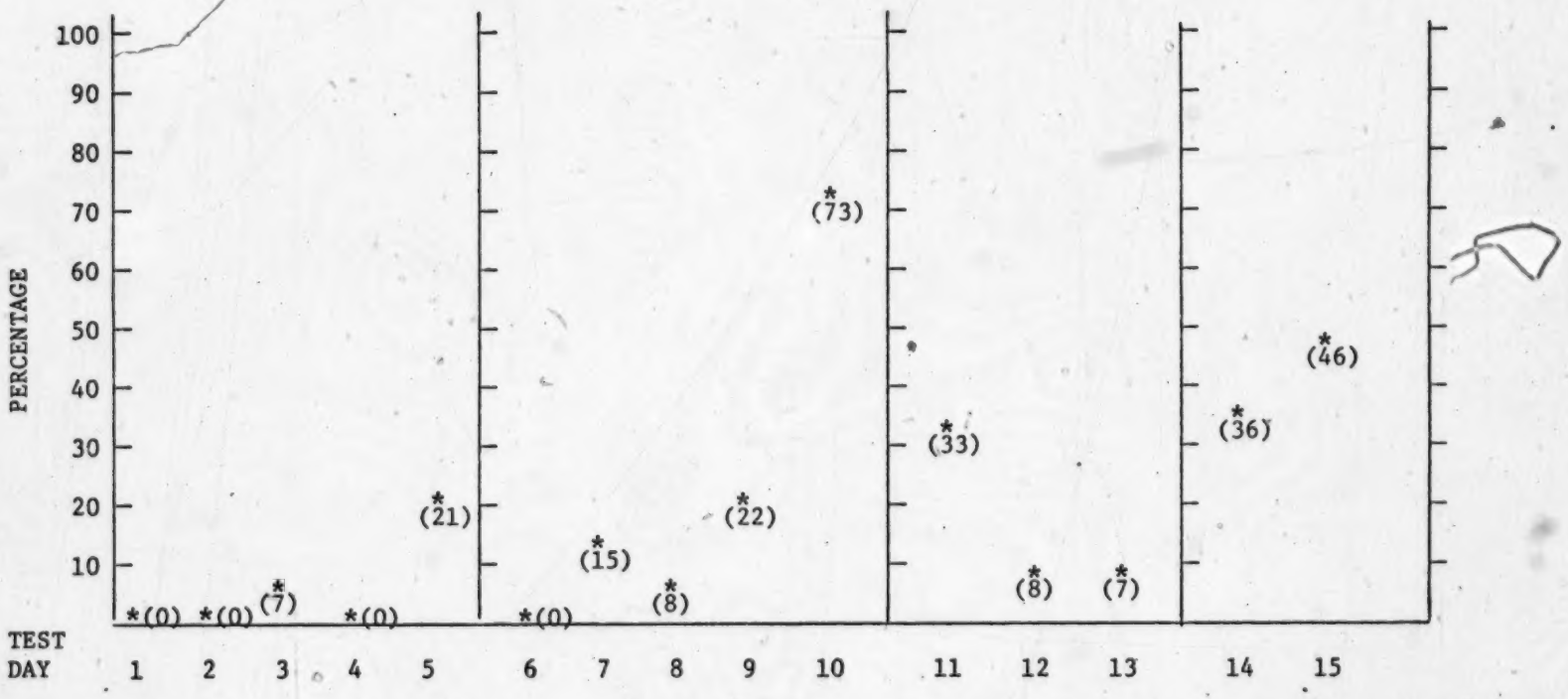


FIGURE 14 - SUBJECT (12)

Percentage of Time Observed in Cooperative Play (Categories 5-8)

TABLE 27

SUBJECT (12)

AVERAGE NUMBER OF COOPERATIVE INTERACTIONS

PER PLAY PERIOD WITH EACH CLASSMATE

Phases of Experiment	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	Days Present
Baseline				.4				.2		.4		/ /		N = 5
1st Treatment				1.4	.2	1.8		1.2			.4	/ /	1.8	N = 5
Baseline		1.7					.3				.3	/ /	1.3	N = 3
2nd Treatment	2.0	3.5		.5	2.0	.5	2.0	1.5	2.0	.5	1.5	/ /	1.0	N = 2

$$\text{Score for each phase} = \frac{\text{Total cooperative interactions (Categories 5-8) for that phase}}{\text{Number of days present during that phase}}$$

TABLE 28

SUBJECT (12)

Time Observed in Each Category of Play

Types of Play Categories	Baseline	1st Treatment	Baseline	2nd Treatment
1. Solo - Unoccupied Behavior	3% (2)	0% (0)	0% (0)	0% (0)
2. Solo - Onlooker	12% (9)	9% (6)	30% (13)	19% (5)
3. Solo - Independent Play	55% (41)	50% (32)	23% (10)	33% (9)
4. Parallel Activity	12% (9)	5% (3)	14% (6)	7% (2)
5. Associative Play	4% (3)	9% (6)	5% (2)	19% (5)
6. Co-operative Assisting Behavior	1% (1)	3% (2)	2% (1)	4% (1)
7. Co-operative Physical Contact Behavior	0% (0)	0% (0)	0% (0)	0% (0)
8. Co-operative Task Co-ordination	0% (0)	12% (8)	9% (4)	19% (5)
9. Negative Social Interaction	9% (7)	2% (1)	2% (1)	0% (0)
10. Competitive Play Behavior	3% (2)	9% (6)	14% (6)	0% (0)
Number of Observations	(74)	(64)	(43)	(27)

N = number of observations

% = percentage of total observations for that phase

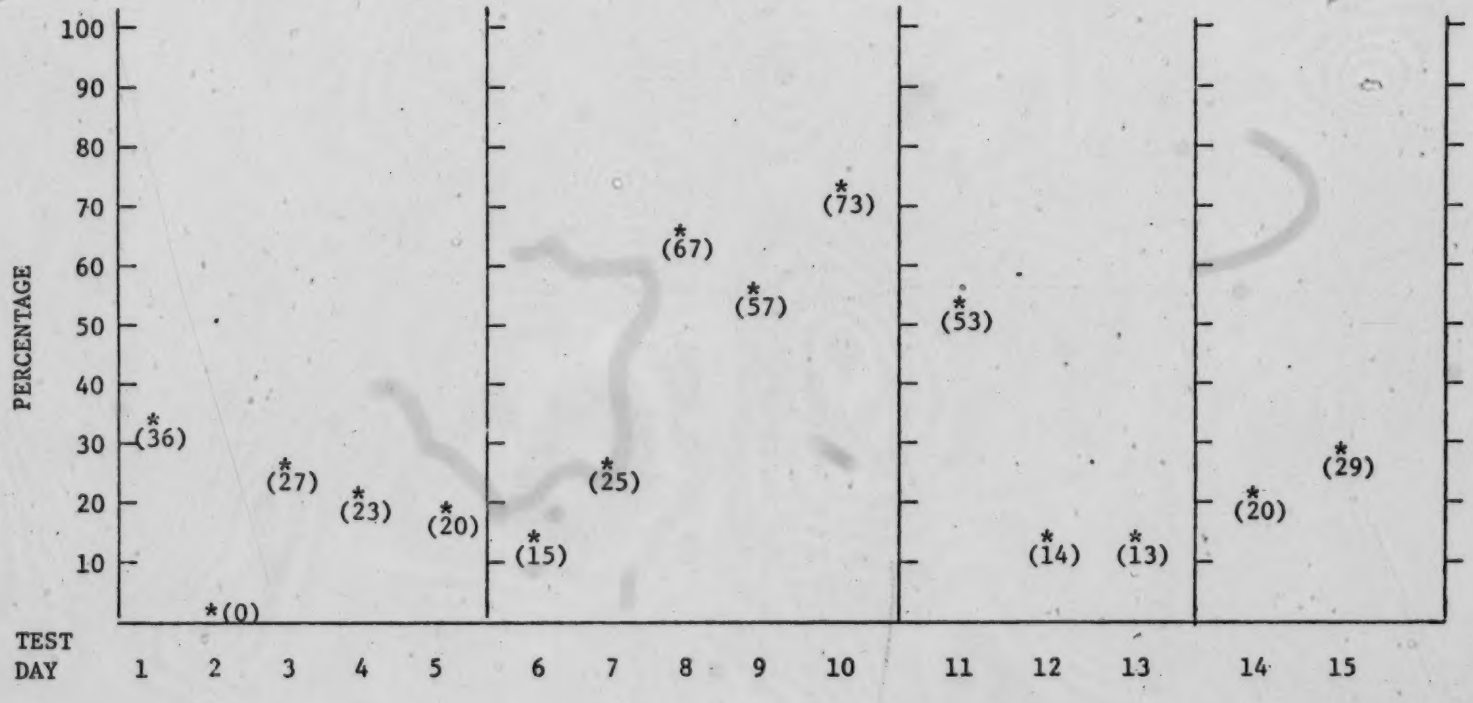


FIGURE 15 - SUBJECT (13)

Percentage of Time Observed in Cooperative Play (Categories 5-8)

TABLE 29

SUBJECT (13)

AVERAGE NUMBER OF COOPERATIVE INTERACTIONS

PER PLAY PERIOD WITH EACH CLASSMATE

Phases of Experiment	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	Days Present
Subjects													/ /	N = 5
Baseline			.8	.6		.4		.2		1.4	1.0		/ /	N = 5
1st Treatment				2.0		4.8		.8		1.6	1.6	1.8	/ /	N = 3
Baseline		1.25		.3		2.0		1.7			.3	1.0	/ /	N = 2
2nd Treatment						2.5				1.0			/ /	

$$\text{Score for each phase} = \frac{\text{Total cooperative interactions (Categories 5-8) for that phase}}{\text{Number of days present during that phase}}$$

TABLE 30

SUBJECT (13)

Time Observed in Each Category of Play

Types of Play Categories	Baseline	1st Treatment	Baseline	2nd Treatment
1. Solo - Unoccupied Behavior	0% (0)	0% (0)	0% (0)	0% (0)
2. Solo - Onlooker	4% (3)	10% (7)	11% (5)	7% (2)
3. Solo - Independent Play	46% (33)	17% (12)	16% (7)	3% (1)
4. Parallel Activity	14% (10)	6% (4)	14% (6)	14% (4)
5. Associative Play	11% (8)	29% (20)	7% (3)	14% (4)
6. Co-operative Assisting Behavior	0% (0)	0% (0)	2% (1)	0% (0)
7. Co-operative Physical Contact Behavior	0% (0)	0% (0)	0% (0)	0% (0)
8. Co-operative Task Co-ordination	10% (7)	20% (14)	20% (9)	10% (3)
9. Negative Social Interaction	4% (3)	0% (0)	7% (3)	17% (5)
10. Competitive Play Behavior	11% (8)	17% (12)	23% (10)	34% (10)
Number of Observations	(72)	(69)	(44)	(29)

N = number of observations

% = percentage of total observations for that phase

Teachers' Background Information: Subject 1

The following information is a transcript of a tape recorded interview with the head kindergarten teacher. It has been edited slightly by the other kindergarten teacher and the author.

> Subject 1 is in her second year of the kindergarten program. Her parents are very supportive of the program. Her mother is a homemaker and her father a plumber. She has 1 older sister who is 7 years of age. She very much disliked the teacher last year and was quite negative towards the new teachers in September and never so much as showed a smile. She was very young for the program last year so that might have been a factor. The only real information that I can think of is that we've (the teachers) seen a tremendous change from absolutely aloof, having nothing to do with the children, only Subject 9, to absolutely rejecting (9) at one stage because of her nonsense. We've tried to bring them into the group separately and now they are an active part of the class.
>
> She lives a couple of houses down from (9) so they've played together frequently and spend a great deal of time with each other.

Discussion: Subject 1 - Female (5 years 11 months)

Subject 1 was present for all testing and games' days throughout the experiment. It was clear from her active involvement that she very much enjoyed the games.

It is obvious from Figure 3 that this subject is a model of the group results but the level of cooperative play is of a much greater magnitude than that of the group. Her final level of 93% cooperative play is second highest in the class, very slightly behind her frequent playmate (9).

The teachers provided information that indicated her close ties with (9) and this is reflected in Table 5. She was also instrumental in bringing (2) into the play group of (7), (5), (9) and herself.

The high increase in cooperative play for all these children is in part a result of an "extended family" role-playing situation. This group, without (2), also engaged in many forms of high task coordination, some of which were copied by the group. One such innovation was the use of skipping ropes to pull friends around the room on the ramp scooters.

Table 6 indicates that this subject followed, and indeed helped establish, the group trend towards cooperative task coordination as the main component (57%) of the cooperative index in the second treatment phase. In the first treatment phase, associative play accounted for 44% of the 73% cooperative play mean for this subject. In the opinion of the author, this reflects an increase in the quality of cooperative play over that of the first treatment phase.

It can be clearly seen that she is not an aggressive child. Following the baseline measure, no competitive or negative social interactions are recorded. That she is an active child, however, is shown by the low, and in some phases nonexistent, frequency of behavior in the Solo Unoccupied and Solo Onlooker categories.

Teachers' Background Information: Subject 2

The following information is a transcript of a tape recorded interview with the head kindergarten teacher. It has been edited slightly by the other kindergarten teacher and the author.

Subject 2 has only been in the program since February. Both she and her younger two-year old brother are adopted. Her father is currently completing work on his Ph.D. and her mother is a homemaker. She was born with a lot of physical problems-stomach troubles and the like - and had 3 major operations in her first year. She is a very shy, quiet girl who doesn't frequently converse with many of the children.

She had traumatic experiences as a child that included separation anxiety due to the fact that she had spent a great deal of time in the hospital. She was still going into the hospital after she had learned to walk and this had set her back a fair bit as at one instance she came home and she could just crawl.

She did not talk until recently. Part of the problem is that her brother is a very outward-going child and tends to organize the family. He talks and he does a great deal of things for (2). She has been having a lot of clinical help for her speech as well as help from some psychologists. They classify her as a passive child with a tendency towards rebelliousness.

The parents really didn't indicate any misbehavior problems at home and the father has given me a good indication of what they expect from her. They are not pushy parents at all and all they want is for her to be happy. They are willing to give her a lot. They really don't have any ideas as to how clever the children are but they put a lot of time in with them.

I have been amazed at the number of professional people who have called up to ask how much of a behavior problem she is. We have worked with her for months and never had any idea of that at all. It's been a matter of building confidence in her and she has adjusted tremendously.

In terms of talking, she isn't the most outward-going child in the class. It is true you could count the number of words she says each day, but she has learned many things. She knows the whole routine of the kindergarten. She has learned to select activities and things that we thought she would never learn to do and she has learned them in a couple of days.

We (the teachers) find her to be a very sensitive child. Apparently she really loves kindergarten and it has brought out a lot more language at home because she is stimulated and has things to talk about and things she wants to tell. The parents are very pleased. The other day, however, and it was partly bad planning on my

> part, we had activities that were too difficult for her and I lost track of her. I found her standing sobbing at the door, waiting for her mother. We (the teachers) had decided that we were going to emphasize some work we hadn't done for a while with the five year olds. It is hard to accommodate the whole group due to the age range. It took a lot to get her back in and it set her back a couple of days. She is very sensitive like that.

Discussion - Subject 2 - Female (4 years 3 months)

Subject 2, as the teachers' information indicates, was a shy little girl who was not overly involved with the other children. It is evident from Table 8 that she spent 97% of her free play in solo activities and had only two incidents of social contact, both of which were of no significance. In the one instance, she was picked up by Subject 7 and in the other she passed Subject 6 the rope. The high percentage of Independent Play (category 3 - 76%) and Parallel Play (category 4 - 16%) indicates, however, that she was far from inactive.

The games program effectively channelled this activity into the associative and task co-ordination categories. She very much liked the games and it was most interesting to watch her and recognize the joy on her face at holding someone's hand, as in retrieving a bean bag to release a classmate in "frozen bean bag". From the first day she was involved, initially with great caution but soon with the same abandon as her classmates.

Her mother was pleased with the teacher-reported progression, and came to watch the games and later free play (from behind a one-way mirror). The results, as Figure 4 indicates, were dramatic. During the first treat-

ment phase, her mean cooperation per class rose from an almost non-existent 3% to a most respectable 56%.

When the games were removed, she dropped to 15% but several differences in her play were recorded as compared with the first baseline phase. Table 8 shows an increase to 16% in solo onlooker behaviors. What this table does not show is that she was now onlooking from close range and approaching many different groups of children and watching and listening to their play and conversation.

In the second treatment phase, there was an important shift in the nature of her play although, as Figure 4 indicates, her mean percentage was 55%, about the same as for her first treatment phase (56%). Table 7 gives evidence of this shift.

In the first treatment phase, her cooperative play was primarily of a role playing variety and was somewhat controlled by Subjects 1, 7 and 9. Because of her size, she was assigned to be the baby in the family of role players. Indeed, on the last day of this phase, her cooperative play dropped to 27%, as she finally became dissatisfied with the rather passive role and being handled by the children. In several observations on this day, the teacher, providing audio for one of the cameras, commented on Subject 2 leaving the scene and on her shift in interest. During the second treatment phase Subject 2 began to seek out her own play companions. As is evident from Table 7, she still played in the "extended family" with (1), (7), (5) and (9), but this was now at her own initiative. She chose, more frequently, (7 times per class) to play with (12) in a "take turns" type of game on the

trampoline and in other areas of the room. More will be said of this contact in the discussion of Subject 12's results.

Finally, it is interesting to note, in light of the background information, that at no time in any of the four phases of the experiment did the subject engage in any competitive play or record a negative social intervention.

In summary, the games program provided this subject with an opportunity to interact with her classmates. At first, this was reflected in free play interactions which were suggested by others, but in the second treatment, the interactions were more frequently a result of her own initiative.

Teachers' Background Information: Subject 3

The following information is a transcript of a tape recorded interview with the head kindergarten teacher. It has been edited slightly by the other kindergarten teacher and the author.

> The third subject is a somewhat different child. He has an 18 month old baby sister at home. His father is currently completing his degree and also working full-time as a truck driver. His mother is a teacher and a homemaker. He is the one child in the class that you can forget about. As an example, the other day when we went down to gym, I didn't realize he wasn't there. He is very quiet.
>
> He has a definite pattern that he reverts to when something happens. When he first started to come to school, he stayed for about one week near a toy that was similar to one he had at home. He was only using it as a comforter because he watched everyone from that point. One day, while he was gone, I removed it. He was very upset the next day and ran in circles trying to find it. I had to bring the toy down again. From there, he gravitated towards the other children.

He is very funny when he first comes to school every morning and usually it is the same every day. He used to come in about ten to ten instead of half past nine. It was at the time when I (the teacher) wasn't waiting at the door for the latecomers. Sometimes he and the parent had taken all that time to get from the car to the door. He would come in, very shy, hang back behind his mother's dress and that sort of thing. When he got in, we might be in a circle involved in some activity and he would stand right in back and only come towards the children in the circle one foot at a time. However, the parents say he very much likes school.

He is having quite a lot to do with Subject 8 as of late. If you get him by himself, he talks non-stop. He is on to this idea that he has got to have buddies and he likes approaching (8) and also (11).

The reason for his being somewhat different as of late is that he is very sensitive about his mother. He doesn't like her going to work at all but he likes her being at home. She has just started a full-time job this week (4 weeks into the experiment). This morning he had a belly-ache. He said he would be okay. Today, his excuse was that he had a belly-ache but he thought it would be gone by gym time.

You can put pressure on him though if you insist that he must do something. He'll object but eventually he will say okay and he joins in.

Discussion: Subject 3 - Male (4 years 8 months)

Subject 3 was initially a most hesitant participant in the games. During the first treatment phase he would not play several of the games or only play for a few minutes and then fade towards the sideline. He was absent on 3 of the 12 days during this phase. The only game he expressed a real desire in playing was Non-Elimination Hot Potato which was played at his request (much to the author's surprise) towards the end of the first treatment phase. In the second treatment period he was much more active in all games but still tended to shy away in the more fast-paced games (e.g. Fish Gobbler).

From Figure 5 it is evident that there is no appreciable increase in cooperative play until the mid-point of the first treatment phase. Insufficient data in the second baseline does not allow any assessment, but there is an appreciable gain during the second treatment phase to a mean of 38%.

Subject 3 never did establish an extensity of social contacts but, as Table 9 indicates, the intensity of his relationship with (11), and to a lesser degree (8), increases drastically in the second treatment period. They began to form a small "mountain climbing" social group in the class. Table 10 indicates that in the earlier phases much of this behavior was parallel play (category 4) but became associative in nature. Towards the end of the first treatment phase, and into the second baseline, he began to imitate (11)'s play, as (8) had been doing to some extent. He gradually worked himself into this group in the second treatment phase. Their main activity, mountain climbing expeditions up the climbing apparatus in the free play room, was initiated by (11).

The shy behavior indicated by the teachers, coupled with his absences, retarded his progress till very near the end of the program. The absences during the second baseline restrict a more thorough analysis.

Teacher's Background Information: Subject 4

The following information is a transcript of a tape recorded interview with the head kindergarten teacher. It has been edited slightly by the other kindergarten teacher and the author.

> Subject 4 is a very active child. She has two brothers, one 10 and one 7 years of age. Her father is working on his Ph.D. in education; her mother works on a Bachelor's degree in education in the mornings and at a nursery school in the afternoons. She attends her mother's program in the afternoon and our's in the morning.

She was very used to an extended family back in her home country and has been somewhat homesick since her arrival in Canada a short while ago. She was very complacent at the beginning of the program but had quite an outbreak in December. She was classified at birth as hyperactive, so lately she has been kept off food coloring and the like. Her parents are very busy, always on the go. She is in her mother's program in the afternoon and her mother says that she's very aggressive towards the other children. We (the teachers) don't find her too bad that way, but she will stand up for herself. She can be very sensitive to other children and she is very bright and very quick.

Discussion: Subject 4 - Female (5 years 8 months)

Subject 4 was a very active participant in all of the games. The same high level of energy is evident in the free play setting where she is in constant motion around the room. Table 11 shows an indication of this in the results from the first treatment phase. She made contact with every class member but Subject 5 in the four days she was present. All of these contacts, with the exception of (11) are of low intensity.

Following a baseline mean of 10%, she shows an increase of 30 percentage points to a 40% mean in the first treatment phase. Missing data during the reinstated baseline condition phase and the second treatment phase make further analysis impossible.

Table 12 provided some information on the nature of (4)'s play. Cooperative task coordination, negative social interaction and competitive play all increase as the experiment progresses. Her play contained a very definite physical dimension. Her cooperative acts in category 8 reflect this physical dimension. She, and Subjects 6, 11 and on one occasion 8, set up the "tube swing" game. Two people held a giant truck tire tube while the third swung on the climbing rope from the bench or trampoline and

bashed into the held tube. She could be most cooperative for this physical type of activity but at no time was she observed in any low energy level cooperative venture.

The teachers' background information on this child's hyperactivity is vital to a clear understanding of her play. At times she was a whirlwind of activity around the room and, as indicated in Table 12, a disruptive force engaging in a high percentage of negative social interactions (36% on last day).

Table 12 also indicates that 80% of her activity during the baseline phase was of the solo variety (categories 1-4). She had but 4% negative social interactive and competitive play during this two and one half weeks period. It seems apparent that the games emphasis on social contacts and interaction had an effect on her play, but her energy level was not conducive to many of the low activity level interactions modelled during the games. It would be most interesting to have observed the effect of a program of highly active cooperative games on the behavior of this subject. The most active game, energywise, was Fish Gobbler and, without question, her favourite, as she requested it each day games were played.

Teachers' Background Information: Subject 4

The following information is a transcript of a tape recorded interview with the head kindergarten teacher. It has been edited slightly by the other kindergarten teacher and the author.

> Subject 5 has 1 younger brother. His father is a theatre producer and his mother also works in drama. His parents suggest that he has been a very different child from the time he was born. They don't think he is brilliant but they do

think he is different. He seeks out adult companionship as well as attention, but he likes to have a conversation with you and he brings up many questions. The parents suggest that he is very attached to the children and he talks of them a lot but, until recently, we haven't seen this and we haven't been that successful in getting him to play with the other children. He would do anything but that.

If you introduce some sort of an idea, such as a theme - playing shop or doctors - he is quite anxious to get involved. He sticks to an idea and he is very methodical. When we first introduced him to the gym for instance, he stood back but would not try anything. He stared at the trampoline for days and then, one day, he got on and stayed with it all day. He's been like that with a lot of things - words, numbers and reading.

He doesn't really have the means to continue a relationship with a child while they are playing, so he reverted to hitting a bit. You can explain to him how you can talk about what you want and tell the other child because he has tremendous language and he knows how to use it, but he hasn't had the practise. He is the youngest child in the program so that may have a lot to do with it.

He taught himself the alphabet at 18 months and he could read "anything" at 3 years. He makes up words; he plays with words. He makes up stories and yet he is not into fantasy. He is a very factual child. The other day he asked his mother "Why is it that the sun is out sometimes and the moon is out other times? Why can't they both be out at once?" She gave him a funny sort of answer which he knew wasn't right. He kept at her and at her until he found out the right answer. He chewed that over for weeks asking questions about it and now he's got it all worked out.

Discussion: Subject 5 - Male (3 years 10 months)

Subject 5 was a fairly quiet child but he took part in all the games, and feedback from home received through the teachers indicates he enjoyed them a great deal. Figure 7 shows his results are in line with those of the group.

The teachers' background information helps to give a clear picture

of his play. An analysis of Table 13 indicates that he was part of the role playing group with (1), (2), (7) and (9) that was alluded to in the discussion of Subjects 1 and 2. The teachers indicated that (5) was much more interested in being involved with other children when an idea or theme was involved. This was clearly the case as all of the cooperative interactions (Table 14) occurred through his role as the "dog" in the "family" group.

There are several interesting trends within his play as the experiment progressed. As was the case with Subject 2, but to a lesser extent, he initiated more social contacts on his own towards the end of the second treatment phase. He has only a 20% cooperative level on the last day of the second treatment phase, but none of these are connected with the role playing group. For example, he has 2 such contacts with (12) in a bat and ball game.

A second trend is a shift away from the teacher and solo involved activities (categories 1 and 2). Subject 5 is the youngest, though not the smallest, member of the class. He spent a fair amount of time with the teacher (e.g. 7 observations on one day) during the Baseline period and 27% of his observations were in solo unoccupied or observer categories. There are no observations in either of these behaviors in the final treatment phase.

Teachers' Background Information: Subject 6

The following information is a transcript of a tape recorded interview with the head kindergarten teacher. It has been edited slightly by the other kindergarten teacher and the author.

Subject 6 is a fascinating child. His mother is a librarian and homemaker and his father is a psychologist. He has a younger sister who is nearly two years of age.

He is a very dominant child and he has superb language and is very interesting to listen to. I find that he is one child who gets all my attention if I don't watch out. He is always in there with the other children, very loud and yet can be very sympathetic. He seems to have all the roles worked out, but he does not always use the right one. He can be very obstinate at times.

There is some conflict that goes on between him and (11). He will at times play off (13) against (11). He didn't use to hit very much and it has been quite a recent thing. He seems to be following (11)'s pattern. Recently they appeared to be working as a team. One of them will hit (8) and the other will come over and join in. His immediate reaction is to explain it to the teacher. He will never lie - he just explains it as it happens.

The other day someone was looking through a hole in the box. Another person came out and pushed her out of the way to have a look through. He went up and rammed into that person. He thought that it wasn't right and he took the time to explain it to the child. He'll hit a child and run away and sing out to you while he is running "I'm sorry, I said I was sorry.".

He is a real leader and is very social. You can work with him individually, but when he is with other children you can't pull him out to do a special activity. He likes to be with other children - where the action is. His father would classify him as a rambunctious child.

Discussion: Subject 6 - Male (4 years 11 months)

Subject 6 was an active participant in most of the games, although at times he would suddenly decide that he didn't want to be part of a game and would sit quietly on the sidelines until that game was over.

The results in Figure 8 do not show the clear-cut trend evident in the results of most of the subjects discussed to this point. During the initial baseline phase, data for the third testing day was made up from

extra observation on the fourth day as it was felt that the subject had been absent for too many of the baseline measures. Although this certainly shows consistency in the measuring tool (47% to 50%), it may have caused the mean for that period to be slightly high, as the made-up data was done on a day when the subject was, in light of subsequent data, very cooperative.

During the second baseline phase, the results on test day 11 (Figure 8) appear to be badly out of line (73%). It was on this day that (6) discovered the swing-tube game alluded to in the report on Subject 4, and he stayed with that game for virtually the entire class while other people rotated in, got tired and moved on to other activities.

It is evident from Table 15 that Subject 13 was his most frequent cooperative playmate. Not included in these figures are six incidents during the second treatment phase where he and (13) cooperated to compete against Subject 10. All of these were recorded as competitive play. The low incidence of cooperation with Subject 10 does not indicate a low incidence of contact with that subject as almost all negative social interactions and competitive play activities were engaged in against (10) throughout the experiment.

It is interesting to note, in Table 15, that Subject 6 had no interaction whatsoever with the somewhat less aggressive and milder chilren (Subjects 1, 2, 3, 5, 7 and 9) with the exception of one interaction with (2) and (9) when he entered the role-playing situation.

There appeared to be no conflict between he and (11), and they maintained a steady cooperative level throughout the experiment as indi-

cated in Table 15. They maintained activity in separate groups with the exception of the rope and tube game discussed earlier.

Teachers' Background Information: Subject 7

The following information is a transcript of a tape recorded interview with the head kindergarten teacher. It has been edited slightly by the other kindergarten teacher and the author.

> Subject 7 started in the kindergarten program at Christmas time. Her father is a coach and her mother is a homemaker and a swim coach. She has an older brother who is 7 years of age and a younger sister who is 3 1/2 years of age.
>
> She was in another Kindergarten program before Christmas, but she lost interest and was bored. She was okay to start with in our program, but then she had all this funny business of looking spaced out and crying at times. I didn't know whether she was ill in health or whether it was an attention-seeking device, so I had it checked out. There was nothing wrong with her health and apparently you have got to be a bit stricter with her. I didn't want to be cruel to her but there was something drastically wrong with her.
>
> She has worked in with the other children very quickly. She can be somewhat dominant at times and tends to take a leadership role when it comes to organizing activities.

Discussion: Subject 7 - Female (5 years)

Subject 7 was a most active participant in all of the cooperative games during the treatment phases of the program and was present on all days throughout the study. The results in Figure 9 clearly indicate that her results are in line with the trend of the group but, as was the case with Subjects 1 and 9, are of a greater magnitude in both treatment phases

than those of the group as a whole. Her second treatment group mean of 86% is third highest for the group, only slightly behind her frequent playmates (1) and (9). It can be seen from Table 17 that during both treatment phases, she is most active with those subjects involved in the role-playing extended family situation.

Subject 7 contributed to the trend of the group in shifting cooperative activity from associative play during the first treatment phase to task coordination in the second treatment phase. During the second treatment phase, 69% of her 86% group mean is accounted for by interactions recorded as cooperative task coordination (category 8). Finally, it is evident from Table 18 that, during baseline periods, she reverted back to independent play, as this category accounts for 55% and 41% respectively of her observed play behaviors in the baseline and reinstated baseline phases of the experiment.

Teachers' Background Information: Subject 8

The following information is a transcript of a tape recorded interview with the head kindergarten teacher. It has been edited slightly by the other kindergarten teacher and the author.

> Subject 8 has one 8 year old brother who is a very docile chap and (8) seems to have all the energy. His father is an instructor at an Institute of Technology and his mother is a teacher.
>
> When he first came to the program, he wasn't quite four and we wondered what had hit us. He was in a complete fantasy world to start with and was very boisterous. He would not have anything to do with the other children and it is only recently that he has tried

to relate to them. He played alongside the other children but was completely in his own little world. The fantasy world became so real for him that the parents thought there was something wrong with his hearing or his eyes as he couldn't focus on anything for any length of time. All of that has changed now. A lot of the changes came over Christmas. We only had a week or two off, but it was good for the children. They came back very, very different. They needed the break.

About 6 weeks ago, he started trying very hard to get in with the other children. He's got some great ideas for playing around and he's a very friendly child. He was a very social kid before. He would go around and chat with the children but he'd never really stay with them. Anyway, very recently he started approaching other children, but he didn't really know how to do it and he started hitting them. The whole class ganged up on him and it was a scary time for him. I had a talk with his mother and, at home, they started reinforcing the fact that you don't hit other children. Now you hear him say, "You don't hit. Hitting's a put down and a put down means you lose a friend." It's really coming through to him so he's trying very hard.

He's a very sensitive child and the only way you can get anywhere with him is to give him lots of attention and be positive. As an example, one of the main problems with him was trying to increase his attention span, because he is very "jumpity". When you read a story to him, you have to praise him to the hilt - "I really like that. Good boy (8) - what (8) did you bring today? Put the bad one in the box....." That sort of thing. We've seen a big change in him over the year.

Discussion: Subject 8 - Male (4 years 8 months)

Subject 8 was a very gregarious little boy who participated in all the games and was present for all days throughout the experiment. He very much enjoyed the games and was most active in suggesting which games should be played when the opportunity arose. His results, presented graphically in Figure 10, closely follow those of the group. A review

of Tables 19 and 20, in light of the background information provided by the teachers, presents a most interesting analysis of Subject 8's play. During the initial baseline phase, Subject 8 had no affiliation with any one group (Table 19). However, despite the fact that only five cooperative acts were recorded in the period (Table 20), these acts are spread over 7 of his 12 classmates. Eight hitting behaviors recorded as negative social interactions (category 9) were also observed during the baseline phase. During the first treatment phase, there was an increase in both the extensity and intensity of cooperative social interactions with classmates. This is evident from Table 19 as Subject 8 has social cooperation with all but two of his classmates during the phase. There is also a drastic reduction (Table 20) in negative social interactions, as none are recorded during the first treatment phase. Following a re-installation of the baseline condition, hitting behaviors returned to a level of 9% of all observations. There was a drastic increase to 20% in parallel activities and a subsequent reduction in cooperative social interactions.

A return to the games program in the second treatment phase of the experiment saw a shift once more to cooperative activities and a reduction, again to zero, of negative social interactions, with all but two classmates included, but one major difference from the first treatment phase is evident. There is a dramatic increase in intensity with Subject 11 to an average of 7 cooperative actions per class during this phase of the experiment. It was mentioned in the discussion of Subject 3 that Subjects 11 and 8, and to a lesser extent Subject 3, formed a mountain-climbing crew on the bars and apparatus in the Prep Room. Evidence of this is also presented in

Table 20 with an increase to 29% of cooperative task coordination from the 8% level during the first treatment phase.

Teachers' Background Information: Subject 9

The following information is a transcript of a tape recorded interview with the head kindergarten teacher. It has been edited slightly by the other kindergarten teacher and the author.

> Subject 9 is one of two adopted children. She has one older brother whom I shall call Sam. Her father is a University professor and her mother is a Resources teacher.
>
> She was deaf until she was three and, being adopted, there were a lot of friends who were making a fuss over the two children to make the parents feel comfortable. None of them could say how cute she was with what she said, so they would say how beautiful she was. The parents maintain that she went through the "princess syndrome" and used to be a real show-off.
>
> She and her brother became quite overbearing at times as they were pretty well running the house. The parents felt they had to do something about it. They enrolled him (her brother) in a Behavior Modification program and thought that it was unfair to be treating only the one child.
>
> It wasn't a very drastic program. As an example, they might say, "Here is your choice. You can do this or this, you make your choice. Once you have made your choice, you stick with it. The food is on the table at 6:00 o'clock; if you don't eat it, it's in the garbage." Once she didn't eat for about a week. The parents continued to follow through with the program. It worked well for him but she did not respond as well.
>
> I didn't really see that much wrong with her before it started and then we had a lot of attention-getting behavior. We would be reading a story and, even though she is one of the oldest in the class, she would be throwing her legs up in the air or anything like that to get attention.

> For ages, she and (1) never played with anyone else and they only talked with each other, quite apart from the group. They were both enrolled in this kindergarten program last year.
>
> Since we've started the gym program, she has been pretty normal. She is an average little girl, very responsible, creates no problems, although you must be firm with her at times. She used to be somewhat sneaky and do things only when she knew nobody was watching, whereas now she is very open about it all. I think she is a very good student now. Her father is away a lot and when he goes away, the parents let me know so that I will be able to pick up any changes in her behavior. I don't think there is anything wrong with her and you would never know she had gone through any problems.

Discussion: Subject 9 - Female (5 years 7 months)

Subject 9 was a most active participant on all games' days and was present during all school days for the experimental periods. Her results, like those of (7) and (1), are a model example of the acquisition of high levels of cooperation through a cooperative games-playing experience. Her overall mean of 96% during the second treatment phase is the highest in the class.

It is most obvious from the data presented in Table 21 that during the first treatment phase, Subjects 1, 2, 5 and 7 are her most frequent playmates and that this trend extends to the second treatment phase. The extended family situation has been discussed in reference to the data of other members in the group and will not be discussed here. It is of interest to note that Subject 9 engaged in no negative social interaction or competitive play during either treatment period. She is one of the subjects who contributed to the shift from associative play (59%) during the first treatment phase to cooperative task coordination (79%) during the second treatment phase.

Teachers' Background Information: Subject 10

The following information is a transcript of a tape recorded interview with the head kindergarten teacher. It has been edited slightly by the other kindergarten teacher and the author.

> Subject 10 started the program in January. He has one older brother and his father is an architect while his mother is an artist who works at home.
>
> He played a lot of tricks on me (the teacher). He is very sulky only if he knows he is getting your attention. He can be sick one minute and cry so authentically that it gets you in. We have started being a bit tougher on him and he is working very well.
>
> I don't know what sort of troubles he has with the other children at times. He tries very much to be a part of them, but he seems to get bashed around a fair bit. He likes playing with (12). They are in the same car pool so perhaps this has something to do with it.
>
> Apparently he likes to play with guns at home and it very much upsets his mother. She isn't all that anxious to have him playing with toy guns. He can be a very aggressive child but I really think he doesn't quite have the social tools yet to interact with the other children as much as he wants to.

Discussion: Subject 10 - Male (4 years 11 months)

Subject 10 was present for all of the games periods, but never seemed to acquire the ability to deal with the physical contact and close social interaction that were part of the games. In short, he seemed to enjoy the games very much, but could not carry out the cooperation required. He had particular problems in dealing with games that required a great deal of physical contact. As an example, in the game of Fish Gobbler, rather than reaching out and touching another person in order to "save" them from the fish gobbler, he was more likely to

bowl into them or tackle them and knock them over. This was never done with malice during the playing of the games but more out of enthusiasm and excitement. He was forever coming up with an injury, sometimes real, but most frequently of the attention-getting variety.

The results in Figure 12 are a complete reversal of form when compared with those of the nine previous subjects. The main breakdown occurs at the midpoint in the experiment. Prior to that, his results are very similar to those of Subject 8. It is evident from Tables 23 and 24 that following a baseline measure of 18% cooperation and 17% negative social interaction, there was a reduction to 9% negative social interaction during the first treatment phase and a great increase in the extensity of social contacts (Table 23). During this phase, the subject made contact with all but one member of the class. A return to the baseline situation resulted in an increase to 25% of negative behavior and an increase from 7% to 18% in competitive play.

It is apparent that he continued to make the social contacts but without the free play rehearsal of the cooperative games. This trend continued into the second treatment phase with an increase to 34% in negative social interactions and 21% in competitive play activities. A good many of the negative social interactions were a direct result of competitive play with (6) and (13) that changed when one of the participants inadvertently got banged around. It is clear from a perusal of the video tapes that Subject 10 was most anxious to make social contacts. As he moved around the room, he was constantly creating noise and ostentatious gestures to attract attention to himself. When his attempts were

ignored , because for the most part they did not fit in with the role-playing and cooperative task coordination that were going on at the time, he reacted on some occasions by striking out, at times out of frustration.

Subject 10 needed more time in the initial treatment period and perhaps more individual attention so that he might acquire a method of making contacts with other children that were not of an aggressive, physical nature. His data, in the early stages of the experiment, closely resembles that of Subject 8 but, in the case of Subject 10, there was no set program of discouraging negative social contact at home and at the school, as was the case with Subject 8. There is no indication whatsoever that this child is incapable of cooperating. He is a very pleasant little boy who is more than willing to participate and does not seem to act at all out of malice. It is clear, however, that he must be taught how to cooperate if he is to get along and play constructively with other children.

Teachers' Background Information: Subject 11

The following information is a transcript of a tape recorded interview with the head kindergarten teacher. It has been edited slightly by the other kindergarten teacher and the author.

> Subject 11 is an only child. His father is a Computer Programmer and his mother is a part-time teacher and homemaker.
>
> He goes from program to program. He is here in the morning, at Montessori in the afternoon, gym on Saturday and art lessons on another day. His mother invites children in and is very good at getting them to work together, but doesn't always know what to do about his outbursts. She doesn't really want him to be over-

aggressive, but his father maintains that it is a part of childhood.

He is very similar to his father in a lot of ways. His father was very to the point when I first met him. "That'll never work with children of this age...", and yet in a couple of minutes later, he is a very soft, pleasant man. I see that in (11).

He was very obnoxious to start with and I didn't think we would ever get close to him, whereas now you can talk to him and he'll listen to you. You can make him stop and get his attention and even have physical contact with him. He used to shy away from that.

He can be very demanding and he loves (6), doing anything for (6)'s attention. They are both very similar, dominant personalities so there is some conflict between them at times.

Discussion: Subject 11 - Male (5 years 1 month)

Feedback from Subject 11, his mother and the teachers, indicated he very much enjoyed the games program. He was always full of suggestions as to how we might modify the games and as to what games should be played. He was present for all days during the two treatment phases.

His results are presented in Figure 13 and the means follow very closely those of the group. Unlike many of the other subjects, (11) had no strong affiliation with any one group, but moved from group to group on his own initiative and spent a great deal of time playing by himself. The range and variety of his contacts is clearly evident from the data in Table 25. In the first baseline treatment, he makes contact with every student but Subject 10, whom he has no dealings with whatsoever through the entire experiment. Subject 11 was the largest boy in the class and as a consequence, (10) had very little to do with him. He is the only subject who fits into the three main groups that operated in the play

environment. In one instance, he could be performing mountain-climbing with (8) and (3) on the bars, move to the role-playing group of (1), (2), (5), (7) and (9) and eventually end up with (4) and (6) playing with the tube and the rope.

His results in Table 26 clearly show the shift from associative play in the first treatment phase to task coordination in the second treatment phase that was observed in the analysis of group results. The incidence of negative social interaction observed for Subject 11 appeared to be fairly constant throughout the experiment with but a very small decline. It is, however, important to note that the nature of the negative social interactions which occur shifts from those instituted by the subject himself, in the baseline observation period, to a reaction to those who interfere with his play - most notably (10) and (4) in the remaining phases of the experiment.

At no time did he coerce others into playing with him, but merely allowed them to work themselves into his play if they chose to do so. There was no open aggression visible between he and (6) and for the first three phases of the experiment (6) was his most frequent playmate, but not to any great degree. During the last phase of the experiment, the second treatment phase, (8) became his mountain-climbing partner and thus most frequent playmate.

Subject 11's play was most interesting to observe. He displayed a wide variety of activities, some of them very elaborate and he led the way to many new types of play for the rest of the children. It was Subject 11 who discovered that the small chairs used during the cookies and juice break, when turned on their side, made excellent "cars." He was fascinated

by ropes and established the mountain-climbing fantasy. It was (11) who invented the rope swing into the tube game and, at one point, had (6) and (13) engaged in a moon landing expedition with small chairs tied behind their backs with ropes, simulating astronauts' paraphernalia.

Teachers' Background Information: Subject 12

The following information is a transcript of a tape recorded interview with the head kindergarten teacher. It has been edited slightly by the other kindergarten teacher and the author.

Subject 12 has an older sister, a younger brother and a new baby in her family. Her father is a professor at the University and her mother is a homemaker.

They have one of the closest families I have ever seen with a very strong sense of family identity. We have found her to be almost a model child in some ways and, on the other hand, she sits back a lot and waits for directions. If you introduce a day in which they are free to make choices, she needs help. Not always, but she does need some direction. She loves adult attention. During gym or free play, she'll do things such as "I've got a secret and I'm not going to tell you" so that you will stay with her. She likes running away so that you will chase her. She likes talking German, thinking that you won't know what that is.

As far as playing with other children goes, we have a block area at the school that was a bit below her at first. The other children would all be getting into a Star Wars theme and she was not going to condescend to that, but now she is right in there with the others. She is very much loved by the children, particularly the younger ones. She is very motherly to them if they approach her. She does not approach them very often.

I've never found her to be any sort of problem, but when the parents came for an interview, they asked me if she had any tantrums. I was amazed. They said that she has a violent temper. Obviously she doesn't think school is the place for it.

Her sister is her best friend and they share everything together. The girls and the mother do a lot of things together.

> I don't know what sort of program the mother has, but whatever she does, she seems to include the girls in it. They do wonderful things so I guess she gets a lot of her friendship at home.

Discussion: Subject 12 - Female (5 years 2 months)

Subject 12 was present on all testing and cooperative games' days during the experiment. She expressed great interest in the games program and very much enjoyed being active with the other children.

Her results, presented in Figure 14, show a moderate increase in cooperation when compared with those of the group. A closer analysis of the activities during each of the four phases of the experiment is necessary for a clearer understanding of Subject 12's interactions with her classmates. During the initial baseline phase, Subject 12 played pretty much by herself and almost always on the trampoline, her favourite piece of equipment. She also used it as a vantage point from which to observe other children's play and in all phases of the experiment had a fairly high percentage of onlooker behavior. Of the four cooperative play behaviors observed during the baseline phase, all occurred on the trampoline. During the first treatment period, there was an increase to a mean of 25% in cooperation, but all of these interactions still took place on the trampoline, or on the border of the trampoline, which was used as a platform for swinging on the climbing rope. This resulted, as is evident from Table 27, in a slight increase in the extensity of the social contacts that (12) had with other subjects, but in no great appreciable increase in intensity. She did on one occasion play a bouncing game on the trampoline with Subjects 4, 6, 8 and 13, thus accounting for higher scores for those individuals.

A slight shift occurred in her cooperative play during the second baseline even though she recorded but seven cooperative acts. Three of these occurred in other areas of the room as she began to move away from the trampoline. In the final treatment phase, only 4 of her 11 cooperative acts occurred on the trampoline, the rest occurring at other points in the room. Table 27 shows a tremendous increase in the extensity of her contacts as she has at least one cooperative act with all but one of her classmates. It is also evident that she became more heavily involved with Subject 2. She took (2) under her care and played with her at various points in the room.

Subject 12 was a very pleasant girl who willingly shared the trampoline and other pieces of equipment with those around her, but who did not establish any close contacts during her play, with the notable exception of Subject 2 during the last phase of the experiment. This contact fits in very well with the background information given by the teacher as to Subject 12's ability to relate to the younger children.

Teachers' Background Information: Subject 13

The following information is a transcript of a tape recorded interview with the head kindergarten teacher. It has been edited slightly by the other kindergarten teacher and the author.

> Subject 13 has an older sister who is 8 years of age. His mother teaches music at home and his father is a University professor.
>
> At the beginning of the year, he was a very shy boy and hardly spoke to you at all. He was in the program last year and was very quiet. This year, there are more boys

his age in the program and he is in a car pool with (6) and (11): He gets along very well with (6) but there is a bit of friction between he and (11), although not that much. He was a very passive onlooker at first and slowly got involved with the other children in the block room of our school. He likes a common activity with others in that area. He is not a leader at all and, until Christmas, he followed (6)'s direction. (6) always sets the pace. After Christmas, there was a very distinct change in him. He would answer back and follow only when it suited him. He now stands up very well for himself. He is a very pleasant child with a nice disposition.

Discussion: Subject 13 - Male (5 years 10 months)

Subject 13 was present for all school days during the experiment and was a most active participant in the cooperative games program.

His results (Figure 15) closely follow those of the group for the first three phases of the experiment, but his level of cooperative play (24%) for the second treatment phase is well below the group mean (53%). One of the reasons for this decline is a rise in competitive play to 34% (Table 30). In the discussion of Subject 6, his most frequent playmate (Table 29), reference was made to their competitive play with (10) as the opponent. There was indeed great cooperation between (6) and (13) in terms of chasing together, communicating as to what to do and where (10) was, coordinating "attacks" etc., but because the nature of the interaction with (10) and the activity as a whole was competitive, these observations were classified as category 9, competitive play. This, once again, raises the paradoxical nature of the relationship between competition and cooperation. More will be said on that issue in the conclusion in Chapter VI. It suffices here to indicate that there is not the clear distinction between the two concepts that many researchers would seem to suggest.

As was the case with Subjects 6 and 10, there appears to be a connection between the rise in competitive play and an increase in negative social interaction. Subject 13 follows a similar trend with an initial decline to 0% during the first treatment period, where the majority of interactions were of a cooperative nature, but a subsequent rise to 7% and 17% during the last two phases (Table 30). This rise mirrors a rise in competitive play behavior, and a review of the videotape recordings indicates that 80% of the negative interactions in the second experimental phase are a direct result of competitive play which evolved into negative social interactions. None of the negative social interactions for Subject 13 appear to have resulted from cooperative interactions evolving into this type of behavior.

CHAPTER VI

COOPERATIVE GAMES AND CHILDREN'S PLAY: AN INTERPRETATION

Introduction

The purpose of this chapter is to consider, in light of the results of the cooperative games free play experiment, the three research questions presented in Chapter I. A fourth analysis will also be presented; a critical review of the instrument.

Research Question 1

What are the play patterns of kindergarten aged children and what, more particularly, is the nature and level of their cooperative play?

This question has been dealt with in great detail in the preceding Chapter. It is sufficient to say here that the baseline measures of free play behavior are very similar to those found by Barnes (1971). In particular, a low degree of cooperative play and a very high degree of solo or independent play was evident in the baseline measures in this research as was the case in the Barnes' Study.

Research Question 2

What is the relationship between cooperative, competitive and individualistic free play behaviors?

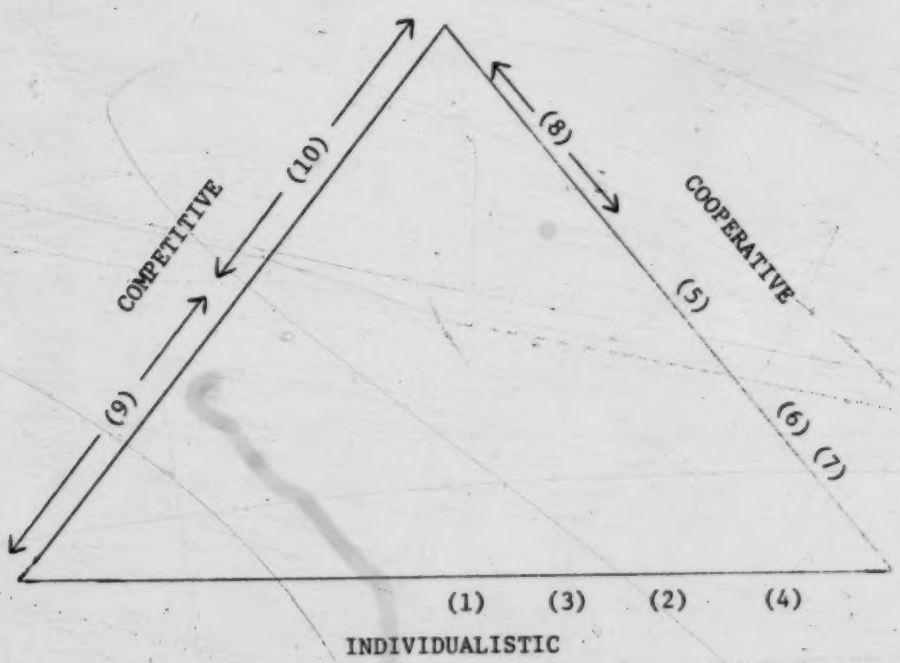
It is of interest, following the completion of the study, to once again look at the nature of the relationship between competition, cooperation and individualism. In the review of the literature, the presentation on this topic was drawn mainly from the work of Margaret Mead (1961).

She suggested that there was in fact a triangular relationship between the three concepts. This relationship is presented in Figure 16 along with an attempt by the author, in light of current research, to locate the ten categories of play on the sides of that triangle much as Mead located different cultures (see page 14). It should be noted here that "the midpoint on each side of the triangle is taken as the most intense development of that emphasis while the places nearest the apexes stand in a more intermediate position." (Mead, 1961, p. 461).

Category 1, Solo Unoccupied Behavior, is located to indicate strongly individualistic behavior. It stems from the definition of this behavior that the individual is involved with no-one else and, in fact, is inactive and alone. Likewise, category 3 also represents a strongly individualistic position as the individual strives for a goal without reference to others. Category 2 is located at a more intermediate position slightly towards cooperative behavior because, by definition, the child is watching other children play and is well within talking distance but does not in any way interfere with their play. Category 4, Parallel Play, is an even more intermediate position because, although the child is "doing his own thing," he is sharing space with other children and indeed in many cases, pieces of equipment, toys, etc. However, he still is engaged primarily in individualistic behavior because he participates without reference to the other children's play.

Category 5, Associate Play, is located in a strongly cooperative position on that side of the triangle because here the child shares in the play of other children. The children are cooperating in the sense of

Figure 16



CATEGORY CODE

1. Solo - Unoccupied Behavior
2. Solo - Onlooker
3. Solo - Independent Play
4. Parallel Activity
5. Associate Play
6. Co-operative Assisting Behavior
7. Co-operative Physical Contact Behavior
8. Co-operative Task Co-ordination
9. Negative Social Interaction
10. Competitive Play Behavior

getting along together but are also definitely with each other. An even stronger form of cooperative behavior is evident in category 8 in which, in Mead's terms, "the goal is shared and it is the relationship to the goal which holds the cooperating individuals together..." (Mead, 1961, p. 17). The arrows, in connection with the eighth category, indicate that it can be very strongly cooperative in the sense suggested by Mead above, or may begin to show signs of a slightly competitive orientation where the goal orientation of the group takes on a conquest-type form. An example might be where children are trying to build a big house together to see how big they can make it. There is, in fact, some external standard with which they are comparing their end result, but they are cooperating in the sense that they all build it together, and are not competing against any other individuals.

Category 8, Cooperative Task Coordination, is then seen as being on a continuum from intrinsic satisfaction and fun at the more cooperative centre position of that side of the triangle to conquest over some external goal or comparison against some standard at the other end of the continuum which is closer to the top apex of the triangle.

Categories 6 and 7, in Mead's terms, would be referred to as helpfulness. "The goal is shared only through the relationship of the helpers to the individual whose goal it actually is." (Mead, 1937, p. 17)

Categories 9 and 10 are located on the competitive side of Mead's triangle. Category 10, Competitive Play, ranges from a more cooperative stance, towards the upper apex of the triangle, to a more competitive stance towards the centre portion of that side of the triangle, in direct

proportion to the degree to which the loser in the competition loses face. At the upper end of this continuum, activities which are primarily goal-oriented, such as which group could build the biggest house, are located, whereas the other end of the continuum is reserved for one-on-one, "winner take all" activities.

Category 9 is also seen as running on a continuum from satisfaction in beating someone (at the centre point on the competitive side of the triangle), to the building up of one's self at the complete expense of others (at the apex of the triangle formed by the individualistic and competitive sides). This category is considered completely negative, in that the degrading of the other person or persons is the primary goal while the object itself becomes secondary.

Research Question 3

What is the nature of the effect of a cooperative games-playing experience on the free play behavior of children?

It is clear from the results of the case study presented in Chapter V that the games have a most definite effect on the nature of the children's free play. The most obvious change was an increase in two of the four categories of cooperative play that were recorded. The question to be answered here, however, is: what was the nature of the link between cooperative game playing experience and the resulting increase in cooperative free play?

B.J. Skinner (1953) labelled a study by Azrin and Lindsley (1956) as essential, because it established, in human behavior, the principle that cooperative behavior is acquired when it is reinforced,

and it can be extinguished when reinforcers are terminated. In this early work and in later investigations by many behaviorists, the general form of reinforcement was some type of candy. Later studies, by Wahler (1967), Hart (1968), Serbin (1977) and others, demonstrated similar effects in increasing cooperation through social reinforcement, and in using peers to reinforce appropriate behaviors. Altman (1971) investigated the effects of a cooperative response learned in a laboratory situation, and social behavior during free play. "M. an M.'s" were used to reinforce the behavior in a laboratory setting, but there was no experimenter-given reinforcer to maintain the behavior in the free play, yet he concluded "this study demonstrates that a social response (cooperation learned in a laboratory setting) influenced the nature and the frequency of social interaction in an extra-laboratory situation (free play)." (Altman, 1971, p. 394). Sherif (1956) was able to reduce hostility between competing groups by establishing overriding goals which appeal to both groups. The tasks were such that both groups had to get together and cooperate to reach their end goal.

Although these studies, which are reviewed in much greater detail in the third section of Chapter II, employ a wide variety of methods and occur in very different settings, they all have one thing in common: they all have shown that cooperation levels can be increased through reinforcement, and they provide clues to the understanding of the results of this current study.

The games, much as was the case in Sherif's work, provided overriding goals for which the group's members had to cooperate to achieve.

The children's cooperative efforts during the games result in (1) social reinforcement from the teacher, in terms of positive feedback and praise; (2) reinforcement from peers, in terms of positive feedback and expressions of affection; and (3), intrinsic reinforcement, through self-satisfaction and a feeling of achievement when the end goal is reached. Successful experience in these environments increased the children's overall repertoire in cooperative behavior (see discussion of sub-problem 1), and this appears to have been drawn from in the free play setting.

In this research, the free play setting does not differ drastically from the gymnasium environment in which the games were taught. Both are perceived by the children as play environments. There is little question that there may be some response generalization, in that the child sees both environments as being similar. Because he receives praise for sharing in the games' environment, it is not inconceivable that he expects similar types of reinforcement within the free play setting. It is also possible, as Orlick suggests, that "the peers would become both models and mediators of a response paradigm" (Orlick, 1977a, p. 34). Several of the studies (e.g., Wahler, 1967) reviewed in Chapter II, clearly indicate that peers are very powerful sources of reinforcement and, as such, certainly help maintain the behavior that was heavily reinforced by the teacher in the game playing environment.

A most difficult question to answer, however, is whether the increase in cooperative behavior in the free play setting is due to some internalization of the overall value of competition, or due to the fact that

there has been a transfer in contingencies of reinforcement from the cooperative games environment.

Two trends found in the results of this research suggest that, along with the reinforcement and response generalization arguments presented above, there may have also been some degree of internalization: (1) the accommodation/assimilation argument presented in the discussion of sub-problem; and (2) the fact that cooperative levels did not drop to first baseline level when baseline conditions were re-introduced following the first treatment phase. There are several other possible explanations as to why this occurred, not the least of which is the fact that the games had only been withdrawn for 10 days, but it certainly is conceivable that this small retention represents some internalization of the value of the concept of cooperation on the part of at least some of the subjects.

Instrument Re-appraisal

The review of the literature by this author indicates that the instrument used here is probably one of the most elaborate, to date, for cataloguing and describing children's play behavior.

There are more categories of play analyzed in this, than in any previous instrument, and the use of videotape makes it superior to any of the classroom observer models. The high inter-observer agreement (95.6%) indicates that it is not a difficult instrument to use. There are, however, some shortcomings to the present form that could be rectified without any major modifications being necessitated. The ninth and tenth categories should be reversed. The analysis of sub-

problem 2 indicates that many forms of competition contain strong cooperative components, and therefore, this category (i.e., 10) might more logically precede the current category 9 - Negative Social Interaction - which at no time contains any cooperative element. The arrows that indicate the range of categories 8, 9 and 10 in Figure 3 also indicate that these categories could be broken down into several smaller categories in much the same way as was done with Cooperative Play.

The instrument appears to have a fair degree of versatility, in that it served the function of a descriptor of children's play as well as a method of analyzing the degree of cooperative play in children.

With variations in sampling procedures and methods, this instrument could be modified slightly, and used in a great variety of research in the area of children's play.

CHAPTER VII

SUMMARY AND CONCLUSIONS

Summary

The main focus of this research was to determine the effects of cooperative games' participation on the nature of social interactions among kindergarten children in a free play setting. This problem was dealt with in two phases. The first phase was a critical review of theory and research and the evolution of tools necessary to conduct a natural experiment examining the effects of a cooperative games program on children's free play social behavior (the second phase of the research). The major portion of this research was the use of this interaction instrument to ascertain as to whether or not a cooperative games playing program had any influence on type and the extent of social interaction between the children in a free play setting.

The subjects for the study were thirteen children (3 years 10 months to 5 years 10 months of age) enrolled at the University of Alberta Elementary Education Kindergarten. Following a 3-week baseline videotape measurement of their free play interactions, children were given daily classes in cooperative games (for 12 days) immediately prior to their free play period. During this first experimental phase of the program the videotaping of the children's free play was continued. Following this experimental phase the children were again returned to the baseline condition of no cooperative games, but videotape records of their interactions during free play were continued. This third phase of the project lasted

one and a half weeks. During the final week of study, the experimental cooperative games program was reinstituted followed by the videotaping of free play sessions.

All of the videotape sessions were conducted in an extensively-equipped playroom containing climbing apparatus, slide, trampoline, and numerous toys. The children were videotaped with with three VTR units.

The units took 10-second samples of the children, individually rotating through the class list for a total of 15 observations of each child during each play period. The play periods lasted 30 minutes. The third VTR unit, which had a remote microphone, was set up to capture behavior of the slide area. This portion of the room was not easily videotaped from the platform on which the other two cameras were located. If, while doing 10-second samples, the camera person was unable to locate the child, or saw the child moving towards the slide area, he/she merely recorded the footage that his/her VTR unit indicated, and that sample was taken from the videotape recording from the third machine. The videotape recordings were viewed by the researcher and a record was made of the type of play engaged in for each 10-second observation for each child. Samples of the sheets used for this procedure are located in Appendix A. Observer accuracy measures were taken during all four phases of the project (Appendix B).

The results from these record sheets were then tabulated to examine whether or not the cooperative games program had any effect on the nature of the interactions between the children in a free play setting.

The results and discussion were presented in the fifth chapter for the group as a whole as well as for each individual subject. The discussion of each individual subject's results was preceded by background information on each child which was provided by the kindergarten teachers. The results of this experiment clearly indicate that the games program had a strong effect on the overall amount of cooperative play observed in the subsequent free play setting. Two of the four categories of cooperative play (associative play and task coordination) account for this change. The baseline group mean for the combined four cooperative categories of the free play interaction instrument indicates that cooperative play was at a relatively low level (13.2%) when compared with independent play (77.4%). The percentage of time the children were observed in cooperative play increased dramatically during the first treatment period to a magnitude of 51.1% on the last day, with an overall mean of 47.1% for the five test days during the first treatment phase. There was a sudden drop to a group mean of 27.7% during the reinstated baseline condition period which lasted for seven days.

During the second treatment phase the group cooperative mean rose to 53% in just three days, clearly establishing a link between the games and the increased cooperation in the free play setting. A more thorough analysis of the results for both the group and the individuals was presented in Chapter V.

Conclusions

(1) A review of theory and research on the relationship structurally and sequentially between types of social behaviors (competitive, cooperative, individualistic)

suggests a triangular relationship similar to that developed by Margaret Mead (1961) between these types of social behaviors. (see Figure 3, p. 144)

(2) The ten category interaction instrument developed to describe cooperative play behavior in children's free play proved to be a useful tool for this purpose.

(3) An analysis of children's free play social behavior with the interaction instrument indicated that play patterns in this sample were very similar to those found in the sujects' study by Barnes (1971). The trend towards individualistic behavior that Barnes (1971) noted when comparing his study with that of Parten (1932) was evident in the analysis of the results of this study. Over 77% of the play behaviors observed during children's free play were of the individual or solo type.

(4) An analysis of children's free play behavior following a cooperative games program indicates a major shift from individual play to two of the cooperative forms of play. Whereas only 13.2% of the behaviors observed during the baseline phase of the study were of a cooperative nature, 47.1% were in these categories in the first treatment phase and 53% during the second treatment phase.

(5) It is concluded, therefore, that the cooperative games had a major effect on increasing cooperative behaviors during the subsequent free play period.

Implications for Further Research

There are several possible follow-up studies or extensions to this current research that are suggested by the results. Much work could be done improving the instrument. The games themselves are open to modification and research might be conducted to investigate the apparently close link (on the basis of this research, at least) between specific game behaviors that are reinforced, and the exact nature of free play behavior changes. One of the more interesting possibilities is that of play sequence.

It was not intended that this research investigate the order in which changes from category to category occur. A post study examination, which was somewhat limited, yields interesting possibilities for further research and will be presented with that intention in the section that follows. The investigation into play behaviors that precede or follow specific behaviors would be facilitated by a change in methodology from the 10 second sample procedure utilized here to a full 30 minute VTR of each child's play.

Play Sequence

The children in this experiment were observed approximately 15 times in each 30 minute play period. The VTR recordings, then, represent a 10 second sample of each child's play behaviors every two minutes. Although it certainly may be argued that much behavior may occur in the two-minute interval between observations, it is possible to obtain a reasonably representative notion as to the flow of the child's play through the 30 minute period. Of more particular interest to the discussion here is the nature of this flow in terms of individualistic,

competitive, and cooperative play behaviors. A behavior recorded in category 1 or 2, both of which indicated that the child is physically inactive, was most frequently followed by play of an individualistic nature - either independent play or parallel play. Only infrequently was an observation in either of these two categories followed by a cooperative play experience, and then only if the initial category was category 2 (Onlooker) and not category 1 (Solo Unoccupied). This is not surprising in that the child may first observe the play before deciding whether or not to enter into it.

There is no clear trend in the subsequent behaviors for category 3 (Independent Play). It may be said that the subsequent behaviors are generally unpredictable and that there is almost equal likelihood of entering into any of the other nine categories of play. Children who were recorded as engaging in Parallel Play, the fourth category, most frequently were found to be engaged in either independent play or cooperative play during the subsequent observation. As an example, on several occasions Subject (3) paralleled the activity of Subjects (8) and (11) in their rope-climbing expeditions on the climbing apparatus. On the next observation, he was most frequently either still paralleling their activity or had worked himself into the group and was engaged in some form of cooperative play.

The cooperative play categories - 5, 6, 7 and 8 - most frequently were followed by a second observation of cooperative play. The only trend evident is that category 5 (Associative Play) is the frequent antecedent of category 8 (Task Coordination).

Category 10 (Competitive Play Behavior) most frequently indicates that the following observation will fall within the same category or, on many occasions, in category 9 (Negative Social Interaction). It is of interest to note that in only two instances in the 146 competitive play observations during the experiment was an entry in this category followed by an entry in category 8, and on only six occasions followed by an entry in category 5. The vast majority of the time, there is an intermediate step in category 3 or 4 prior to the child entering into any cooperative play. The same may be said for category 9, but to an even greater degree, of the 137 observations in this category during the experiment, only two were followed by cooperative acts of any nature despite the two-minute interval between observations. It should also be noted here that observations in category 9 tended - as was the case with the cooperative categories - to come in bunches. Two Subjects account for 60 of the 137 negative social interactions observed during the entire experiment: Subject (4) had 25 such behaviors, and Subject (10) 35 negative social interactions.

The whole question of the flow of a child's play from one type to another requires more extensive investigation. The results presented above are not conclusive. This study was not designed to investigate this problem, but the interaction instrument coupled with a more complete videotaping technique, could provide valuable information to researchers in the area of children's play.

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APPENDIX A

1) Cooperative Games

2) Experimental or Treatment Program

1) Cooperative Games

The following is a description of the cooperative games which were used in this study. All the games are a result of Dr. Terry Orlick's efforts and this entire section is drawn directly from his work (Orlick, 1977).

Log Roll (Laughing logs) -- Six or more players (logs) lie next to one another on their stomachs on the floor. One player lies on his stomach across their backs. All the logs begin rolling in the same direction giving one player (the rider) a ride across the top of the logs. When the rider reaches the other side he becomes the first rolling log, and the last log becomes the rider. This continues all the way across the gym. I had originally called the game giant log roll but a five year old informed me that they were really laughing logs. Observations: high degree of active involvement; high degree of cooperation; high level of enjoyment for all age groups.

Barnyard -- The class is divided into three or four groups of animals. This is done by having each person select an animal name or picture out of a hat, or by the instructor whispering the names of different animals to different players (e.g., cow, wolf, snake). The players are then scattered around the room and are either blindfolded or are asked to shut their eyes. The object of the game is to find all the members of your group and link arms with them. The only allowable means of communication is your animal sound. Observations: high degree of involvement; high degree of cooperation in linking together; high level of enjoyment for

all ages. Variations: groups can be formed of equal numbers of different animals. For example a group must end up with 3 cows, 3 snakes and 3 wolves. A specific order can also be requested (i.e., cow, snake, wolf, cow, snake, wolf, etc.). All different groups of animals can link together making sure they are all there and then as a group find the sleeping, snoring farmer or the little lost sheep (both of whom are stationary but can make soft sounds). Each group of animals can find their den which can be designated by a stuffed animal, a large [redacted], a rope, etc. With eyes open and voices silent, each person can imitate his animal and claim as his mate(s) other people imitating the same animal. Pairs or groups of similar animals can link up and move around the gym together as if they were one animal. The children guess at what the other groups of animals are. (Good for kindergarten through grade two.)

Fish Gobbler -- All the players spread out around the gym. On the signal "ship," they all run towards one wall and on the signal "shore" they quickly change directions and run toward the opposite wall. On the signal "Fish Gobbler" they quickly drop to the floor on their stomachs and link up to one or more friends. The fish gobbler cannot get anyone if they are linked together. (The caller can pretend to be a fish gobbler.) Once everyone is linked to someone else, the signal "rescue" is called and all players remain linked and yell "yah" raising their joined hands over their heads. Observations: high degree of active involvement; good level of cooperation in linking together; high level of enjoyment for kindergarten through grade 3.

Partners/Mirror-Mirror -- Children run, hop, skip around the gym and on the signal "Partners," they quickly find a nearby partner, hold hands and sit down or "freeze" together on the spot. One child then becomes a mirror and must imitate whatever the other child does. The children take turns being the mirror. The children then move around the gym again briskly until they hear "Partners." At this time the children must find new partners. Observations: high degree of active involvement; good degree of cooperation imitating partner and taking turns; good level of enjoyment for kindergarten through grade two.

Frozen Bean Bag -- Children move around the gym at their own pace with a bean bag on their heads. The instructor can change the pace by calling: skip, hop, go backwards, etc. When the bean bag falls off a child's head, he is frozen. Another child must then pick up the bean bag and place it back on his head to free him, without losing his own bean bag. The object of the game is to help your classmates. At the end of the game the instructor can ask how many people helped their friends or how many times they helped their friends. If desired, a cumulative score can be taken. Observations: high degree of involvement; good level of cooperation in unfreezing friends; good-high level of liking for grade one through four.

Frozen Tag -- A few people are "IT" while the rest of the children scatter around the gym running in all directions. When a child is tagged he must "freeze" in a stride position or with a hand extended. A classmate must either pass under his legs or shake his hand to free him. The number

"IT" can be adjusted to keep the game moving. At the conclusion of the game the instructor can ask how many unfroze their friends. In normal tag games there is no opportunity to help someone. Here there is. Can also be played in water where a child must swim under a person's legs to unfreeze them. Observations: high degree of active involvement; good level of cooperation in unfreezing friends; high level of enjoyment for kindergarten through grade five. Variation (Frozen Pair Tag): Played in pairs with twin "ITS," twin tags, twin freezes and twin freeing. Partners must run together, freeze together and unfreeze together with both partners shaking hands with the frozen pair or going under the frozen pair's legs. Can also be played in groups of three.

Non Elimination Hot Potato -- The children join hands and sit down to form a potato passing circle. A hot potato (e.g., bean bag or ball) is passed around the circle from one person to the next until the potato caller (who is outside the circle facing the other way) yells, "hot potato." The person with the potato in his hands at this time joins a separate circle (potato callers circle) and chooses a number to which the callers count softly together before yelling "hot potato" in unison. The game continues in this manner until all the children have switched to the potato caller's circle and have each had a chance to select a "hot potato" number to count to. Observation: involvement on a rotating basis; good level of cooperation in the potato caller's circle, little cooperation in the potato passing circle; good level of enjoyment for kindergarten and grade one. It is interesting to note that the children have no sense of

losing in this game. They enjoy being in either circle as both circles are in.

Bean Bag Balance -- Children try to balance or hold a bean bag between them while moving around the gym or through an obstacle course. They can use their bodies or they can balance the bean bag on a stick (as long as it is not possible to do without the help of a partner).

Popcorn Ball -- Each child is a piece of sticky popcorn moving around the gym. When one piece of popcorn touches another piece, they are stuck together. Once stuck they continue to move around together until they end up in one big popcorn ball. A similar type of game can be played by telling the kids to pretend they are magnets being pulled together.

Wagon Wheels -- About seven children join hands to make a circle, which forms a wagon wheel. The wheel has to move in a circular motion so that it goes around the walls of the gym. Two or three children (the bottom of the wheel) have their backs to the wall momentarily as the wheel spins along the wall. Very cooperative and quick sense of accomplishment. The wheel works.

Blast Off -- The children are asked if they can make one big space ship which is connected all over. A few leading questions such as what does the space ship need, may help in its formation (e.g., front, sides, fire in the back, people inside). "Now let's see if the space ship can blast off across the room without coming apart." If they land on the moon they they can be astronauts linked together with life line.

Big Snake -- Children are asked to make a two people snake that wiggles on the floor and hisses, then connect up for a four people snake and then an eight people snake until the whole class is one big snake. At various times the children can see if they can turn the snake over on its back without coming apart, or see if the snake can go over a mountain (big mat). Children seem to enjoy getting the whole snake together.

Double Bubble -- Children form groups of two (or three). The children hold hands to form a small circle and move around the room. They begin by walking slowly and are careful not to bump into other groups. The object of the game is to work together to avoid collision, as each group is a bubble and they must be careful not to break their bubble. Children can hop, skip, or run around once they become familiar with the game. Another objective may be taken in the same game. The children in groups of two or three are still bubbles but the objective now is to break the little bubble to make a bigger bubble. This can be done by two bubbles squeezing together until the bubble pops into a four people bubble. This continues until there is one giant bubble left.

Balloon Burst (Big Tire) -- Children get into groups of six or eight, join hands and make a circle. They are a balloon and as the teacher blows (makings blowing sounds) they get bigger and bigger until they "pop" back into a little ball in the center, all still holding hands. The teacher can stand in the center of the room with a real ballon and tell the kids to pretend they are all this one balloon. Blow it up slowly, quickly; let the air out quickly, slowly. Blow it up until it breaks, if you have

the courage to do so.

The Big Ship Sails --

Oh the big ship sails through
The alley alley o, the alley alley o, the alley alley o,
Oh the big ship sails through
The alley alley o
High ho alley alley o

The children hold hands and form a circle. Two children form the beginning of the ship. One child holds on to the other child's waist and they weave in and out of the circle, going under the raised arms of the other children. When the verse stops at "high ho alley alley o," the ship stops and the two children with arms raised directly over the end of the ship join on the back of the ship. The smaller circle reconnects and the bigger ship weaves in and out again as the children sing the song. The ship continues to get bigger in this manner until finally all children are part of the big ship and they sail around the room singing with the leader taking short snappy steps.

Thread the Needle --

The thread follows the needle
The thread follows the needle
In and out the needle goes
As we mend the clothes

A single line of not more than eight children join hands. The first child is the needle and begins by leading the line (thread) under the raised arms of the last two children (7th and 8th). The 7th child ends up facing the 8th with his arms crossed in front of him. This forms the first stitch. The needle then leads the line under the arms of the 6th and 7th children which forms another stitch. This is repeated until

the entire line has been stitched with the leader turning under his own arm to complete the last stitch. To "rip" the stitch the children raise their arms over head and turn back to their original positions. The 8th child now moves to the front of the line to become the new needle. Everyone should get a turn as needle. Note -- the children maintain hand hold contact throughout the whole stitching portion of the game.

Turtle -- A gym mat acts as the turtle shell and about 8 children get under the shell and make the mat move in one direction. The children can try to get the turtle to go over a bench or through an obstacle course without losing the shell. For soft shell turtles a blanket, tarpoline or mattress could be used.

Mat Toss (Blanket Toss) -- A group of 8 or 10 kids gather around a mat and attempt to toss one child in the middle. With kindergarten children the child in the middle gets rolled around more than tossed and they all enjoy it. A rotation for taking turns in the middle can be suggested at the beginning. A variation of this is Mat Pull (Tug Along) where the mat is pulled quickly to the other side of the gym with one person sitting or lying on the mat. Each person gets a turn in the middle. Mat Toss can also be tried with older kids over a large landing mat or with a webbed mat hip deep in water.

Caterpillar Over the Mountain -- Children get on their hands and knees and hold the ankles of the child in front of them. Four people form one 16 legged caterpillar and they move around the room and over the mountain (a mat draped over a bench). Caterpillars link up with other caterpillars

until one giant caterpillar is formed which crawls over the mountain. A whole class caterpillar needs more than one mountain to crawl over.

Can You (Do things together) -- This game has an infinite number of variations. The common thread running through the different activities is that children must achieve the objective together, with one or more friends.

> Can you walk through a field of sticky glue with your partner? Swim through jello with your partner; be real tall with your partner; be real small with your partner; be one frog with your partner?
>
> Can you do a round thing with your friend while holding his hand?
>
> Can you bounce your partner like a ball?
>
> Can you and your partner hold hands and saw wood together like lumberjacks?
>
> Can you make a human chair for your partner to sit on? A two people chair, a four people chair?
>
> Can you get behind your partner and wrap your arms around his front? Can you walk at the same time as he does?
>
> Can you skip around with three friends? Can you make a fort with your friends and all get inside it?
>
> Can you go through an obstacle course (e.g., under bench, through hoop, across beam) without letting go of your partner's hand?
>
> Can you make a people tunnel that someone can go through? Can you take turns going through the tunnel but keep the tunnel as long as possible?
>
> Can you find your partner's heart beat? (After a quiet game, after an active game?)
>
> Can you each get a stick (or broom) and together with a partner try to bounce and catch a beach ball using both of your sticks?

Can you get in groups of 3 or 4 and see if you can carry a beach ball across the gym holding it way over your heads using floor hockey sticks or brooms?

With your back stuck to your partner's back, can you move around the gym? Jump forward towards this wall, jump backwards towards this wall, both get inside a hoop and move around still stuck back to back?

Can you roll a big hula hoop on its edge so your partner can run through it? Can your partner roll it so you can run through it?

2) Experimental or Treatment Program

Not all games were played as frequently as others. The following summary outlines which games were used on each day of the experimental or treatment phases.

First Treatment Phase

Day 1
(1) Fish Gobbler
(2) Frozen Bean Bag
(3) Partners
(4) Can You
  1) Bounce your partner
  2) Be a chair
(5) Balloon Burst
(6) Non Elimination Hot Potato (30 min.)

Day 2
(1) Mat Toss
(2) Surfer (mat-pull)
(3) Can You
  1) Make a people tunnel (25 min.)

Day 3
(1) Frozen Bean Bag
(2) Fish Gobbler
(3) Balloon Burst
(4) Double Bubble (30 min.)

Day 4
(1) Turtle
(2) Surfer (2 mats)
(3) Non Elimination Hot Potato
(4) Pairs Bean Bag (35 min.)

Day 5
(1) Can You
  1) Be tall
  2) Be small
  3) Walk through sticky glue
  4) Swim through jello
  5) Be a chair
  6) Walk behind
(2) Fish Gobbler
(3) Popcorn Ball (35 min.)

Day 6
(1) Caterpillar Over the Mountain
(2) Balloon Burst (Big Tire)
(3) Big Ship
(4) Fish Gobbler
(5) Non Elimination Hot Potato

Day 7
(1) Blast Off (plus Life Line)
(2) Fish Gobbler
(3) Big Ship

Day 8
(1) Fish Gobbler
(2) Non Elimination Hot Potato
(3) Big Ship
(4) Balloon Burst
(5) Big Snake

Day 9
(1) Barnyard
(2) Fish Gobbler
(3) Non Elimination Hot Potato
(4) Balloon Burst (Big Tire)
(5) Big Snake

Day 10
(1) Fish Gobbler
(2) Balloon Burst (Big Tire)
(3) Big Snake
(4) Non Elimination Hot Potato
(5) Popcorn Ball
(6) Can You
1) Make a tunnel

Day 11
(1) Bean Bag Balance
(2) Frozen Bean Bag
(3) Fish Gobbler
(4) Double Bubble
(5) Thread the Needle
(6) Non Elimination Hot Potato

Day 12
(1) Wagon Wheels
(2) Big Ship
(3) Fish Gobbler
(4) Frozen Tag
(5) Thread the Needle
(6) Barnyard

Second Treatment Phase (May 22 - 25)

Day 1
(1) Magnets (see Popcorn Ball)
(2) Big Ship
(3) Fish Gobbler
(4) Non Elimination Hot Potato
(5) Big Snake

Day 2*	(1)	Fish Gobbler
	(2)	Caterpillar Over the Mountain
	(3)	Bean Bag Balance
	(4)	Can You
		1) Build a people tunnel
	(5)	Frozen Bean Bag
	(6)	Thread the Needle
	(7)	Big Ship
	(8)	Balloon Burst
	(9)	Non Elimination Hot Potato
Day 3	(1)	Mat Toss
	(2)	Surfer (mat-pull)
	(3)	Fish Gobbler

*Games were played outside and films were taken.

APPENDIX B

1) Observer Accuracy or Agreement Information

2) Play-Interaction Instrument: Expanded Definitions

OBSERVER ACCURACY

Play Category	Baseline (Apr. 11 & 20)			1st Treatment (May 2 & 4)			Baseline (May 11 & 18)			2nd Treatment (May 23 & 25)		
	Agree	Disagree	%	Agree	Disagree	%	Agree	Disagree	%	Agree	Disagree	%
1	1	0	100	0	0	100	2	0	100	0	0	100
2	11	1	91.6	12	1	92.3	15	0	100	9	0	100
3	34	2	95.6	31	0	100	32	2	94.3	19	2	90.5
4	16	2	88.8	7	0	100	10	2	83.3	6	0	100
5	8	1	88.8	44	2	95.6	18	0	100	17	0	100
6	2	0	100	1	0	100	4	0	100	1	0	100
7	2	0	100	0	0	100	1	0	100	0	0	100
8	6	0	100	11	1	91.6	11	1	91.6	31	2	93.9
9	3	0	100	2	0	100	11	0	100	10	1	90.9
10	3	0	100	7	0	100	16	0	100	8	0	100
	N = 96			N = 115			N = 121			N = 101		

Total N* = 433 (16.7% of total number of observations)

OBSERVER ACCURACY

DISAGREEMENT

	Baseline	1st Treatment	Baseline	2nd Treatment
Observer A (category recorded)	3 4 2 5 3 4	5 5 8 2	4 4 3 3 8	9 8 8 3 3
Observer B (category recorded)	4 5 1 4 2 5	6 4 5 3	9 3 4 5 5	10 5 5 5 2
	N = 6	N = 4	N = 5	N = 5

Total N = 20

	Baseline	1st Treatment	Baseline	2nd Treatment	Overall
Observer Agreement	94.1	96.6	96.0	95.3	96.5

**Formula used $\frac{\text{\# Agreements}}{\text{\# Agreements and Disagreements}}$ X 100

2) Play-Interaction Instrument: Expanded Definitions

The section that follows is designed to give the reader a more detailed description, with additional examples, of the ten categories of the play-interaction instrument. It is hoped that this expansion will provide, for those readers who wish to use the instrument, a more complete and thorough understanding of the intent of each category, and the types of play behaviors that are classified within each.

Category 1: Solo-Unoccupied Behavior

Definition

"The child is apparently not playing but occupies himself with watching anything that happens to be of momentary interest. When there is nothing exciting taking place, he plays with his own body, gets on and off chairs, just stands around, follows the teacher, or sits in one spot glancing around the room." (Parten, 1932, p. 249).

Intent

This category is drawn verbatim from Parten's (1932) study. While it is most difficult to label a child "unoccupied," this category is a necessity in order to differentiate between a child who is physically inactive, one who is inactive but is an onlooker, and the physically active child.

Examples

The behaviors that fall within this category are few. A child that sits or lays head hung might be exhibiting behavior typical of this category. Great care must be taken to ensure that role playing behaviors (e.g. pretending to sleep) are not mistaken and recorded as solo unoccupied.

Category 2: Solo Onlooker

Definition

The child is physically inactive. The child spends most of his time watching the other children play. This type differs from the unoccupied in that the onlooker is definitely observing particular groups of children rather than anything that happens to be exciting. The child stands or sits within ten feet of the group so that he can see and hear everything that takes place (modified from Parten, 1932, p. 249). This category also includes one child in casual conversation with another. The children may be standing or lying while talking to each other. No role playing is evident and no apparent activity results from the conversation.

Intent

This category is also drawn from Parten's (1932) work. The intent is simply to classify any "watching behavior" as distince behavior. The "talking portion" of this onlooker category definition was added so as to include inactive behaviors where children were in conversation. The conversations are generally short in nature and no apparent activity results from them.

Examples

1) A child sits on a stool focussing his attention on playmates on the floor.
2) A child lays on a trampoline, head over the edge, watching two children playing with a rope.
3) A child carrying a toy tractor has stopped en route to the sand box and is standing watching two children arguing over a tricycle. During the observation interval the child doesn't enter into the discussion.
4) Two children are in conversation. No role playing is evident nor is there any evidence of major physical activity, e.g. they are standing, sitting or walking very slowly.

Category 3: Solo Independent Play

Definition

The child plays alone and independently with toys that are different from those used by the children around him. He pursues his own activity without reference to what the others are doing (modified from Parten, 1932, p. 250).

Intent

This category has been modified from one used by Parten (1932). Very simply the child is playing actively but is alone.

Examples

1) A child is bouncing on the trampoline.
2) A child is role playing with toys in the sandbox.
3) A child is bouncing a basketball.

Category 4: Parallel Activity

Definition

"The child plays independently, but the activity he chooses naturally brings him among other children. He plays with toys that are like those which the children around him are using, but he plays with the toy as he sees fit, and does not try to influence or modify the activity of the children near him. He plays beside rather than with the other children. There is no attempt to control the coming or going of children in the group." (Parten, 1932, p. 250).

Intent

This category is drawn directly from Parten's work. The child continues to play independently but does share space with other children. He does not try to influence them, and is not considered to be <u>with</u> them.

Examples

1) Children climbing on an apparatus without communication or contact.
2) Child playing in the sandbox without apparent contact or communication with other children performing the same activity.
3) Several children playing with scooters coming down the ramp. (no apparent "partnership" is evident)

Category 5: Associative Play

Definition

The child plays with other children. All engage in a similar activity. There is a sharing of play materials and a taking of turns should a single toy or a piece of apparatus be involved. The key word here is with. This category differs from the previous category in that the child is playing with the other children.

Intent

This category is different from Category 4 in that the child is actually with other children playing with other children.

Examples

1) Children playing together on a scooter ramp taking turns going down the ramp or starting at the same time by intent.
2) Three or four children bouncing together on the trampoline.
3) Children climbing up the apparatus talking to each other and taking turns as they go across the single bar section.
4) Two children waiting for their turn while one child swings on the rope.
5) Three children "driving" their overturned chairs around the room.

Category 6: Cooperative Assisting Behavior

Definition

One child shares play material with another or assists in the execution of a task. There is a definite division of labour with the children engaged with some particular task. The key word here is assistance (helping behavior).

Intent

This category was included to specifically record helping or assisting behaviors that occurred when one child was not physically playing with the other child, or to record behaviors that were of short duration of an assisting nature.

Examples

1) Two children are in parallel play in the sandbox and one asks the other to hold the stick upright for him while he puts sand around the base of it to support it. The children then return to parallel play. If they had continued to assist each other and commenced to work on a sand castle or a definite task, the behavior would be classified as Category 8 - co-operative task coordination.
2) Upon request one child passes a hockey stick to another.
3) A child at the top of the slide has dropped one of her toys. Another child picks it up and passes it up to her.

Category 7: Cooperative Physical Contact Behavior

Definition

Two or more children engage in physical contact of an affectionate nature. For example, linking arms, holding hands, placing arms around one another, embracing, kissing, or patting another child on the back (Orlick, 1977, p. 7).

Intent

This category was included to capture physical contact of an affectionate nature between two children. There is no apparent task involved as there might be in role playing, which would come under Category 8 - Cooperative Task Coordination. The behavior exhibited appears to be an end in itself.

Examples

1) Two children kissing
2) Two children walking with their arms around each other's neck.

Category 8: Cooperative Task Coordination

Definition

The emphasis here is on performing a single task together, (i.e. lifting a block), working together for a common goal, (piling bean bags), or performing a coordinated action. The key word here is task. There must be a definite task involved, otherwise the behavior is recorded as Category 5: Associative Play (modified from Orlick, 1977, p. 7).

Intent

This definition is modified from the work of Terry Orlick (1977). It differs from the other cooperative categories in that there is a definite task being performed, and most behavior evident is in service of the performance of that task.

Examples

1) One child pulls two other children around the room on scooters using skipping ropes.
2) Two children lie on the trampoline while a third bounces up and down, giving the two a "ride."
3) Five children sit down to "eat" at a table and chairs set up on top of the scooter ramp. Each is playing a definite role

(e.g. mother, father, dog, baby, sister, etc.).

4) A child imitates another.

5) Two children lift and pile large boxes to make a tunnel.

6) One child carries another child.

Category 9: Negative Social Interaction

Definition

Any uncooperative behavior that interferes with a child working on his own task. It may be of a physical nature (pulling, pushing, fightint over toys, etc.) or of a verbal nature (arguing, disruptive criticism, etc.).

Intent

This category was included to record any negative social interactions that occurred between children. These interactions are considered to be of a non-productive nature in the sense that they do not assist one, both, or all of the children involved in completing any task at hand. Fighting, striking, and arguing behaviors fall into this category. As a rule, behaviors that fall into this category are very easy to distinguish

Examples

1) One child hits another child with a hockey stick.

2) One child throws a bean bag at another child yelling "I hate you, I hate you."

3) One child takes a toy from another child and doesn't allow him to play with it.

4) A child verbally assaults another with "Jimmy is a baby, Jimmy is a baby."

Category 10: Competitive Play Behavior

Definition

One child competes with another child or children over an object (i.e. pulling a rope, chasing a ball) or one child is pursued by another, or tries to beat another in the performing of the task. This category differs from Category 9 in that the children involved do so of their own initiative and are playing with other children. There is an element of fun evident in their play.

Intent

As is evident from the definition above, the intention of this category was to distinguish competitive play behaviors from the negative social interactions. Any behavior of a competitive nature was included in this category. It is realized that this category could be expanded into other sub-categories much as the initial category of cooperative play was sub-divided into categories 5, 6, 7, and 8. For the moment at least this category is a catch-all for any form of play in which there is an element of competition.

Examples

1) Two children pulling opposite ends of a hockey stick, laughing loudly.
2) Two children chasing a third around the room (all three are willing participants).
3) Several children pulling on a large rope.
4) Two children sitting on the floor, each trying to pile more blocks than the other.

APPENDIX C

1) Sample Recording Sheet

2) Completed Recording Sheet

3) Explanation of Examples from Completed Sheet

1) Sample Recording Sheet

NAME: _____ DATE: _____

Interval	Type	With	Description
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

Types of Play Categories

1. Solo - Unoccupied Behavior
2. Solo - Onlooker
3. Solo - Independent Play
4. Parallel Activity
5. Associative Play
6. Co-operative Assisting Behavior
7. Co-operative Physical Contact Behavior
8. Co-operative Task Co-ordination
9. Negative Social Interaction
10. Competitive Play Behavior

Person's Code*

1. Mary
2. Suzy
3. Bob
4. Judy
5. Jim
6. Larry
7. Joan
8. Billy
9. Margaret
10. Ricky
11. Bruce
12. Marian
13. Peter

*These names are given as examples only and are not those of the subjects in the experiment.

2) Completed Recording Sheet

NAME: _____ DATE: _____

Interval	Type	With	Description
1	3		Jumping on trampoline
2	5	6	Jumping on trampoline
3	8	10	Setting up "house"
4	8	10	Role playing - 10 is his dog
5	3		Swinging on rope
6	6	8	Passed rope to 8 upon request
7	9	4	Arguing over whose turn it is on rope
8	2		Watching 4 and 8 fight over rope
9	7	8	Arm over 8's shoulder walking across room
10	4	2,5,7	Coming down slide
11	3		Coming down slide
12	10	13	Wrestling
13	3		On climbing bars
14	5	13	Playing on climbing bars together
15	10	13	Chasing 13 around room

Types of Play Categories

1. Solo - Unoccupied Behavior
2. Solo - Onlooker
3. Solo - Independent Play
4. Parallel Activity
5. Associative Play
6. Co-operative Assisting Behavior
7. Co-operative Physical Contact Behavior
8. Co-operative Task Co-ordination
9. Negative Social Interaction
10. Competitive Play Behavior

Person's Code*

1. Mary
2. Suzy
3. Bob
4. Judy
5. Jim
6. Larry
7. Joan
8. Billy
9. Margaret
10. Ricky
11. Bruce
12. Marian
13. Peter

*These names are given as examples only and are not those of the subjects in the experiment.

3) Explanation of Examples from Completed Sheet

A brief explanation of the complete sheet.

Interval 1, 5, 11 and 13

Child is playing alone.

Interval 2, 14

The child is playing with another child (6 in interval 2, and 13 in interval 14) but there is no apparent task coordination.

Interval 3 and 4

Child is playing with 10 and there is a definite task involved.

Interval 6

The child assists another child (8) but doesn't stay to play with him. Assistive behavior is of brief duration otherwise it might be considered as task coordination (Category 8).

Interval 7

The child has a negative social interaction with 4 over the rope.

Interval 8

The child is watching two other children's play.

Interval 9

The child shows affectionate behavior towards 8. There is no apparent task involved but he is definitely with 8.

Interval 10

The child is playing on the slide. Children 2, 5, 7 are also

on the slide but the subject plays along side rather than with them. There is no conversation, in this case, between the subject and the other children.

Interval 12 and 15

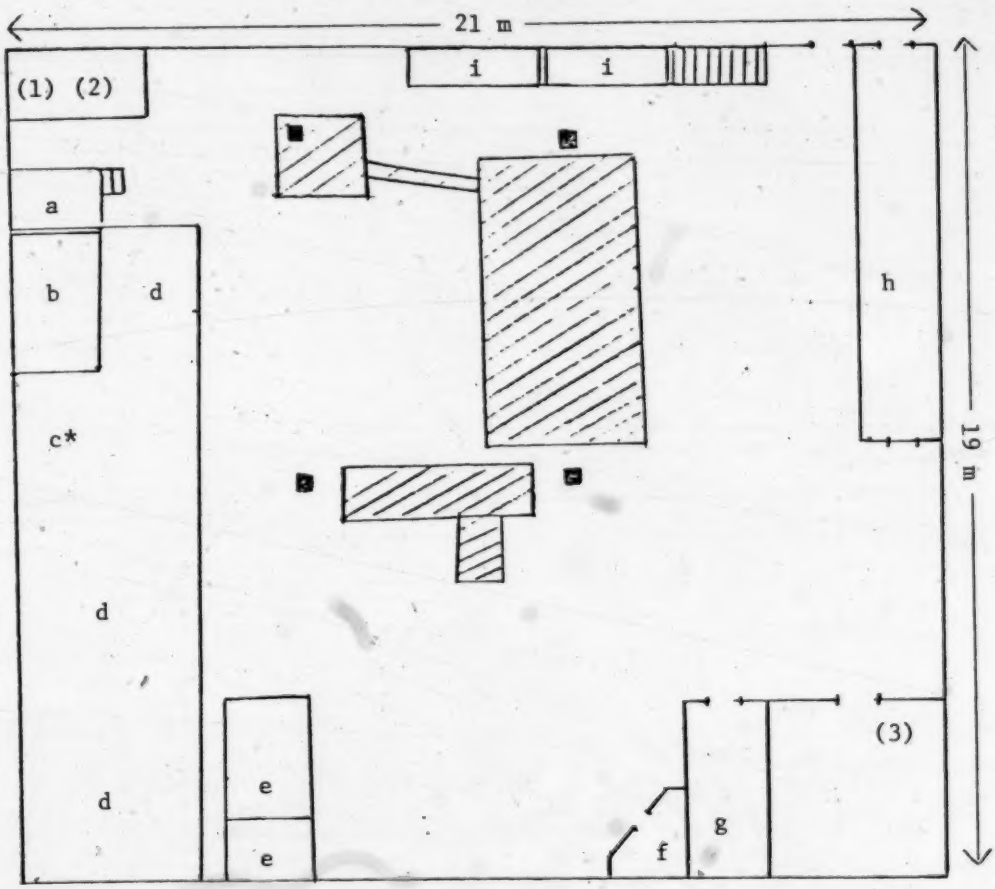
The child, in both intervals, is playing with 13. The play is of a competitive nature but there is an element of fun and therefore it is not Category 9. Neither child is being disruptive of the other's play and both are engaged of their own free will.

APPENDIX D

1) PREP Room Diagram

2) Information on Equipment in Free Play Environments

1) PREP Room Diagram



■ - support pillar

▨ - climbing apparatus

⊣ ⊢ - door

1 & 2 - main cameras (on platform)

3 - slide area camera (in office)

a - steps and platform to trampoline

b - trampoline

c - climbing rope (*suspended from ceiling)

d - large mat (4m x 15m)

e - scooter ramp

f - play house

g - washrooms

h - observation room (one way glass windows)

i - large slide (2m ladder, 3m platform, 3m long slide)

2) Information on Equipment in Free Play Environments

Major Equipment

4 childrens' tables (2 ft./4 ft.)

24 childrens' wooden chairs

3 gymnasium benches (12 ft. long)

1 look-out-tower slide (ladder 6 ft./platform 8 ft./slide 9 ft.)

1 stage platform (4 ft./8 ft.) - 15" high

1 24" platform with 2 steps (4 ft./6 ft.)

1 small trampoline with wedge pads (6 ft./10½ ft.)

1 climbing rope (10 ft. long)

1 large gymnastic mat (15 meters/4 meters)

1 scooter platform and ramp (4 ft./10 ft.)

2 "port a pit"'s (5 ft./10 ft.)

2 shelving units (equipment storage) (5 ft./5 ft.)

1 playhouse (5 fts./5 ft.)

6 6' panel mats

1 5' wedge mat

10 mats (various sizes)

3 large wooden cubes

1 large truck tire tube

Climbing Apparatus

4 stools (various sizes)

1 10 ft. ladder

2 10 ft. bars

2 6' triangle stands

2 10' balance boards

1 10' climbing bridge

Toys

4 scooters

2 dozen balls (various sizes)

9 plastic hockey sticks

3 plastic baseball bats

6 2/1 ft. hand-held mats

4 skipping ropes

2 pair of roller skates

6 large hool-a-hoops

4 small hool-a-hoops

1 toy wooden horse

1 Fisher-Price basketball hoop set

1 Fisher-Price bowling set

2 play telephones

Numerous small bean bags

Numerous plastic donuts (approx. 2 dozen)

2 plastic clothes baskets

1 4' balance board

APPENDIX E

1) Data for Subjects

DATA FOR SUBJECT (1)

DATE	CATEGORY OF PLAY										NUMBER OF OBSERVATIONS
BASELINE	1	2	3	4	5	6	7	8	9	10	
April 6	0	4	4	1	1	0	0	3	0	1	14
April 11	0	3	10	0	0	0	0	0	0	1	14
April 13	1	2	6	2	1	1	0	0	2	0	15
April 18	0	1	4	4	1	0	2	0	0	0	12
April 20	3	2	6	1	1	1	1	0	0	0	15
FIRST TREATMENT											
April 25	0	1	5	0	2	1	1	4	0	0	14
April 27	0	1	2	1	5	0	0	4	0	0	13
May 2	0	0	2	1	7	0	0	4	0	0	14
May 4	0	1	2	0	7	0	0	1	0	0	11
May 9	0	1	0	1	8	0	1	3	0	0	14
BASELINE											
May 11	0	0	7	2	5	0	1	0	0	0	15
May 16	0	3	4	0	5	0	0	0	0	0	12
May 18	0	1	5	2	4	0	0	3	0	0	15
SECOND TREATMENT											
May 23	0	0	1	0	6	0	0	8	0	0	15
May 25	0	0	1	0	4	0	0	8	0	0	13

DATA FOR SUBJECT (2)

DATE	CATEGORY OF PLAY										NUMBER OF OBSERVATIONS
BASELINE	1	2	3	4	5	6	7	8	9	10	
April 6	0	0	11	1	0	0	1	0	0	0	13
April 11	0	2	10	2	0	0	0	1	0	0	15
April 13	0	0	14	1	0	0	0	0	0	0	15**
April 18	0	1	9	5	0	0	0	0	0	0	15
April 20											*
FIRST TREATMENT											
April 25	0	2	3	0	3	1	0	6	0	0	15
April 27	0	3	2	1	3	0	0	6	0	0	15
May 2	0	1	5	0	6	0	0	3	0	0	15
May 4	0	4	0	0	5	0	0	4	0	0	13
May 9	0	0	10	1	3	0	0	1	0	0	15
BASELINE											
May 11	0	4	6	2	0	0	0	3	0	0	15
May 16	0	2	10	2	1	0	0	0	0	0	15
May 18	2	1	8	1	2	1	0	0	0	0	15
SECOND TREATMENT											
May 23	0	3	5	1	3	0	0	3	0	0	15
May 25	0	0	3	1	7	2	0	1	0	0	14

*Absent from program

** Make up data from April 18

DATA FOR SUBJECT (3)

DATE	CATEGORY OF PLAY										NUMBER OF OBSERVATIONS
BASELINE	1	2	3	4	5	6	7	8	9	10	
April 6	1	2	7	2	0	0	0	0	1	0	13
April 11	0	6	5	2	1	0	0	0	0	0	14
April 13	0	0	8	5	1	0	0	0	0	0	14**
April 18	0	1	8	2	1	0	0	3	0	0	15
April 20	0	4	3	4	3	0	0	0	1	0	15
FIRST TREATMENT											
April 25	1	2	6	1	1	0	0	0	2	2	15
April 27	0	0	8	3	0	1	0	1	0	2	15
May 2											*
May 4	0	1	5	2	2	0	0	2	1	0	13
May 9	0	4	5	1	3	0	0	1	0	0	14
BASELINE											
May 11											*
May 16	0	1	7	2	3	0	0	0	0	1	14
May 18											*
SECOND TREATMENT											
May 23	0	2	5	0	2	3	0	3	0	0	15
May 25	0	3	7	0	3	0	0	0	0	1	14

* Absent from program

** Make up data from April 18

DATA FOR SUBJECT (4)

DATE	CATEGORY OF PLAY										NUMBER OF OBSERVATIONS
BASELINE	1	2	3	4	5	6	7	8	9	10	
April 6	1	0	8	0	1	1	0	1	0	1	13
April 11	0	1	10	0	0	0	0	0	2	2	15
April 13	0	2	6	4	0	0	0	0	1	0	13**
April 18	0	1	11	3	0	0	0	0	0	0	15
April 20	0	4	5	1	3	1	0	0	0	0	14
FIRST TREATMENT											
April 25											*
April 27	0	2	2	1	6	2	0	0	2	0	15
May 2	0	1	4	1	6	0	0	1	0	1	14
May 4	0	0	3	0	5	0	0	0	5	1	14
May 9	0	1	8	1	1	0	0	2	1	1	15
BASELINE											
May 11	0	1	0	2	0	1	0	5	4	2	15
May 16	0	2	5	1	1	0	0	0	5	1	15
May 18											*
SECOND TREATMENT											
May 23											*
May 25	0	0	2	0	1	0	0	4	5	2	14

* Absent from program

** Make up data from April 18

DATA FOR SUBJECT (5)

DATE	CATEGORY OF PLAY										NUMBER OF OBSERVATIONS
BASELINE	1	2	3	4	5	6	7	8	9	10	
April 6	3	1	6	2	0	0	1	0	0	0	13
April 11	0	6	4	2	0	0	0	0	1	0	13
April 13	0	4	10	1	0	0	0	0	0	0	15
April 18	0	0	6	6	0	0	3	0	0	0	15
April 20	2	1	1	2	0	0	1	1	0	0	8***
FIRST TREATMENT											
April 25	0	2	1	0	4	0	0	8	0	0	15
April 27	0	1	3	2	5	0	0	2	0	0	13
May 2	0	4	3	1	5	0	0	0	0	0	13
May 4	0	3	2	0	9	0	0	0	0	0	14
May 9											*
BASELINE											
May 11	0	6	6	1	1	0	0	0	1	0	15
May 16	1	2	6	2	4	0	0	0	0	0	15
May 18	0	0	2	0	7	0	0	6	0	0	15
SECOND TREATMENT											
May 23	0	0	0	0	4	0	0	11	0	0	15
May 25	0	0	7	1	1	0	0	1	0	0	10***

* Absent from program

*** Low number of observations due to subject spending much time with the teacher.

DATA FOR SUBJECT (6)

DATE	CATEGORY OF PLAY										NUMBER OF OBSERVATIONS
BASELINE	1	2	3	4	5	6	7	8	9	10	
April 6											*
April 11	0	2	5	4	0	0	0	0	1	1	13
April 13	0	1	4	1	3	0	0	4	1	1	15**
April 18	0	1	4	2	2	1	0	4	0	0	14
April 20	1	0	8	2	2	0	0	1	1	0	15
FIRST TREATMENT											
April 25	1	3	5	1	0	1	0	1	0	1	13
April 27	0	3	7	0	3	0	0	2	0	0	15
May 2	0	3	1	6	3	0	0	1	0	1	15
May 4	0	1	1	2	4	0	0	2	1	2	13
May 9	0	0	1	1	0	0	0	7	0	6	15
BASELINE											
May 11	0	0	0	0	3	1	0	7	0	4	15
May 16	1	1	3	1	0	0	0	2	3	4	15
May 18	0	2	5	0	1	0	0	0	0	7	15
SECOND TREATMENT											
May 23	0	0	2	1	2	0	0	3	0	6	14
May 25	0	1	3	0	3	0	0	3	3	0	13

* Absent from program

** Make up data from April 18

DATA FOR SUBJECT (7)

DATE	CATEGORY OF PLAY										NUMBER OF OBSERVATIONS
BASELINE	1	2	3	4	5	6	7	8	9	10	
April 6	1	2	10	0	0	0	0	1	1	0	15
April 11	0	2	9	0	0	0	1	0	0	1	13
April 13	5	8	2	0	0	0	0	0	0	0	15
April 18	0	0	10	3	0	1	0	0	0	0	14
April 20	0	0	8	1	0	1	0	1	3	0	14
FIRST TREATMENT											
April 25	0	1	2	0	4	0	0	8	0	0	15
April 27	0	0	3	1	7	1	0	2	0	1	15
May 2	0	1	7	1	4	0	0	0	0	0	13
May 4	0	1	2	0	6	0	0	4	0	0	13
May 9	0	1	2	0	7	1	0	4	0	0	15
BASELINE											
May 11	0	3	11	0	0	0	0	0	1	0	15
May 16	1	2	5	0	2	0	0	2	1	1	14
May 18	0	2	2	1	3	0	0	4	2	1	15
SECOND TREATMENT											
May 23	0	1	0	0	4	0	0	10	0	0	15
May 25	0	2	1	0	1	0	0	10	0	0	14

DATA FOR SUBJECT (8)

DATE	CATEGORY OF PLAY										NUMBER OF OBSERVATIONS
BASELINE	1	2	3	4	5	6	7	8	9	10	
April 6	2	1	6	1	0	0	0	0	1	0	11
April 11	0	1	7	3	0	0	0	0	3	1	15
April 13	0	3	5	3	1	1	0	0	2	0	15
April 18	0	1	9	3	0	0	0	0	0	0	13
April 20	0	0	6	0	2	1	0	0	2	0	11
FIRST TREATMENT											
April 25	0	2	6	3	0	1	0	0	0	1	13
April 27	0	2	5	3	1	1	0	1	0	0	13
May 2	0	1	4	0	10	0	0	0	0	0	15
May 4	0	3	6	3	3	0	0	0	0	0	15
May 9	0	0	5	2	3	0	0	5	0	0	15
BASELINE											
May 11	0	2	2	3	5	1	0	0	2	0	15
May 16	0	2	2	3	1	0	0	2	2	2	14
May 18	0	6	2	3	1	0	0	2	0	1	15
SECOND TREATMENT											
May 23	0	1	4	1	3	0	0	6	0	0	15
May 25	0	1	5	2	3	0	0	2	0	0	13

DATA FOR SUBJECT (9)

DATE	CATEGORY OF PLAY										NUMBER OF OBSERVATIONS
BASELINE	1	2	3	4	5	6	7	8	9	10	
April 6	1	3	3	1	2	0	0	1	0	0	11
April 11	0	1	4	3	1	1	0	0	0	3	13
April 13	0	1	6	2	2	0	0	1	2	1	15
April 18	0	1	6	4	1	0	0	1	0	0	13
April 20	0	1	11	0	1	0	1	0	0	0	14
FIRST TREATMENT											
April 25	0	0	2	0	6	0	1	5	0	0	14
April 27	0	0	3	0	8	0	0	2	0	0	13
May 2	0	0	0	1	11	0	0	3	0	0	15
May 4	0	1	1	1	9	0	0	1	0	0	13
May 9	0	0	3	1	7	0	1	3	0	0	15
BASELINE											
May 11	0	0	7	3	4	0	0	0	1	0	15
May 16	0	1	4	1	6	0	0	2	0	0	14
May 18	0	2	3	0	7	0	0	3	0	0	15
SECOND TREATMENT											
May 23	0	0	1	0	4	0	0	10	0	0	15
May 25	0	0	0	0	1	0	0	13	0	0	14

DATE FOR SUBJECT (10)

DATE	CATEGORY OF PLAY										NUMBER OF OBSERVATIONS
BASELINE	1	2	3	4	5	6	7	8	9	10	
April 6	0	0	3	1	1	1	0	1	5	2	14
April 11	0	0	7	6	1	0	0	0	1	0	15
April 13	0	0	5	2	4	0	0	2	1	1	15
April 18	0	2	6	2	0	0	0	1	1	2	14
April 20	0	3	2	1	2	0	0	0	4	1	13
FIRST TREATMENT											
April 25	1	3	2	1	0	0	1	1	4	1	14
April 27	0	1	2	2	4	0	0	0	2	1	12
May 2	0	2	6	4	2	0	0	1	0	0	15
May 4	0	3	7	2	1	0	0	0	0	1	14
May 9	0	0	10	1	1	0	0	1	0	2	15
BASELINE											
May 11											*
May 16	1	1	5	0	0	0	0	1	3	2	13
May 18	0	2	5	1	0	0	0	0	4	3	15
SECOND TREATMENT											
May 23	0	3	3	0	1	0	0	0	3	5	15
May 25	0	4	1	1	0	0	0	0	7	1	14

* Absent from program

DATA FOR SUBJECT (11)

DATE	CATEGORY OF PLAY										NUMBER OF OBSERVATIONS
BASELINE	1	2	3	4	5	6	7	8	9	10	
April 6	0	3	4	1	0	2	0	1	3	0	14
April 11											*
April 13	0	1	6	5	2	0	0	0	0	0	14**
April 18	0	2	10	1	1	0	0	0	0	0	14
April 20	0	1	6	4	2	0	0	0	2	0	15
FIRST TREATMENT											
April 25	0	1	5	2	3	0	0	0	3	0	14
April 27	1	0	4	1	7	0	0	0	0	0	13
May 2	0	2	2	1	7	0	0	2	1	0	15
May 4	0	0	2	0	5	1	0	5	0	1	14
May 9	0	2	5	0	2	1	0	3	2	0	15
BASELINE											
May 11	0	2	2	2	3	0	0	5	0	1	15
May 16	0	4	3	3	1	1	0	0	1	1	14
May 18	0	1	7	5	0	0	0	0	1	1	15
SECOND TREATMENT											
May 23	0	1	2	1	1	0	0	9	0	1	15
May 25	0	0	6	2	2	0	0	3	2	0	15

* Absent from program

** Make up data from April 18

DATA FOR SUBJECT (12)

DATE	CATEGORY OF PLAY										NUMBER OF OBSERVATIONS
BASELINE	1	2	3	4	5	6	7	8	9	10	
April 6	1	2	7	3	0	0	0	0	2	0	15
April 11	0	1	8	5	0	0	0	0	0	1	15
April 13	0	2	9	1	1	0	0	0	2	0	15
April 18	0	4	11	0	0	0	0	0	0	0	15
April 20	1	0	6	0	2	1	0	0	3	1	14
FIRST TREATMENT											
April 25	0	1	10	0	0	0	0	0	0	3	14
April 27	0	2	6	0	1	1	0	0	0	3	13
May 2	0	0	9	2	0	1	0	0	1	0	13
May 4	0	2	5	0	2	0	0	0	0	0	9***
May 9	0	1	2	1	3	0	0	8	0	0	15
BASELINE											
May 11	0	2	4	4	2	0	0	3	0	0	15
May 16	0	5	4	2	0	1	0	0	0	1	13
May 18	0	6	2	0	0	0	0	1	1	5	15
SECOND TREATMENT											
May 23	0	5	3	1	1	0	0	4	0	0	14
May 25	0	0	6	1	4	1	0	1	0	0	13

*** Low number of observations due to subject spending much time with teacher.

DATA FOR SUBJECT (13)

DATE	CATEGORY OF PLAY										NUMBER OF OBSERVATIONS
BASELINE	1	2	3	4	5	6	7	8	9	10	
April 6	0	0	5	0	4	0	0	1	2	2	14
April 11	0	1	9	3	0	0	0	0	0	2	15
April 13	0	0	7	0	1	0	0	3	1	3	15
April 18	0	0	8	1	1	0	0	2	0	1	13
April 20	0	2	4	6	2	0	0	1	0	0	15
FIRST TREATMENT											
April 25	0	2	6	1	1	0	0	1	0	2	13
April 27	0	3	2	1	3	0	0	0	0	3	12
May 2	0	1	1	1	9	0	0	1	0	2	15
May 4	0	0	3	1	5	0	0	3	0	2	14
May 9	0	1	0	0	2	0	0	9	0	3	15
BASELINE											
May 11	0	2	1	1	1	1	0	7	0	2	15
May 16	0	1	2	1	0	0	0	2	3	5	14
May 18	0	2	4	4	2	0	0	0	0	3	15
SECOND TREATMENT											
May 23	0	0	1	3	0	0	0	3	1	7	15
May 25	0	2	0	1	4	0	0	0	4	3	14